The Dissertation Committee for Hong Tien Vu Certifies that this is the approved version of the following dissertation:

Partisan Media and Their Climate Change Agenda-Setting Effects on Partisan Publics: Examining the Compelling Arguments Concept in the Age of Polarization

Committee:

Renita Coleman, Supervisor

Maxwell McCombs, Co-Supervisor

Thomas J. Johnson

Hsiang Chyi

Natalie Jomini Stroud

Partisan Media and Their Climate Change Agenda-Setting Effects on Partisan Publics: Examining the Compelling Arguments Concept in the Age of Polarization

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Hong Tien Vu, B.A. M.S.

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Dedication

For my family

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Partisan Media and Their Climate Change Agenda-Setting Effects: Examining the Compelling Arguments Concept in the Age of Polarization

Hong Tien Vu, PhD

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Supervisors: Renita Coleman & Maxwell McCombs

This dissertation seeks to understand (1) what are the differences in the coverage of climate change among ideologically different media agendas, (2) what effects do these differences in climate change coverage have on partisan publics, and (3) what attributes of climate change coverage have compelling arguments effects on public perception of the issue and the public's willingness to engage in activism. The study comes up with three key findings. First, conservative media tend to adopt attributes that dismiss climate change and its effects as unreal, while liberal media are more likely to emphasize the reality of climate change. Second, this difference in media coverage influences the relationship between media attribute agenda and the perception of partisan publics. For example, media attributes that focus on the negative consequences of climate change exert consistent compelling arguments effects on the liberal public's perception of the issue and intention to engage in climate change activism. However, higher frequencies of a number of climate change attributes in media coverage correlate with decreased

perceived importance of the issue among conservatives. Third, the public's belief uncertainty moderates the effects of the media attribute agenda on the public's perceived importance of climate change and intention to engage in action.

This dissertation advances the compelling arguments concept in several ways. It is the first to provide empirical evidence on the relevance of this concept in examining the relationships between media attributes and behavioral intention. Also, its findings suggest that future agenda-setting research should take into account the fact that in today's highly fragmented media environment, the news media agenda is becoming increasingly heterogeneous. The divergence in media coverage of a controversial issue is found to influence ideologically different public groups differently. Finally, individual predispositions should be considered in examining compelling agenda-setting effects on public perception and behaviors. Including differences in the news agenda as well as among the public will provide deeper insights into understanding the complexities of media effects on audiences.

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CHAPTER 1: INTRODUCTION

On June 24, 1988, Scientist James E. Hansen from NASA's Goddard Institute for Space Studies told the Congress it was 99% certain that global warming had begun, and that it was caused by pollutants in the atmosphere (Leiserowitz, 2005). The testimony, which followed heat waves with record-high temperature, made headlines in major news media publications, bringing global warming to the agenda of policymakers as well as the public. The *New York Times* the next day printed: "Global warming has begun" (Shabecoff, 1988).

It has been more than 25 years since that first congressional hearing, and global warming or climate change is still a controversial topic politically, economically and religiously (McCright & Dunlap, 2011). And in terms of media coverage of climate change, since the initial article in *The New York Times*, news coverage about this environmental phenomenon has been up and down. More than once, the news media, citing scientific findings, have warned of the earth being close to the tipping point, where actions need to be taken (Mooney, 2015). But the news media have also had reports claiming the whole climate change issue is a hoax, and that fear mongers were exacerbating the results of natural weather variations (The Washington Times, 2015). These views paint two different and contrasting pictures of climate change, showing deep partisanship.

Public opinion has been divided on such aspects as whether global warming is happening or what has caused this environmental problem, among others. For example,

polling data show that in 2001, more than 60% of the American public believed the effects of climate change "have already begun," and almost 55% attributed the increase in the earth's temperature over the past century to "the effects of pollution from human activities." In 2011, these figures were below 55% and 50% respectively (Marquart-Pyatt, Shwom, Dietz, Dunlap, Kaplowitz, McCright, & Zahran, 2011). These statistics attest to climate scientists' concern that accurate public perception of climate change is far from enough to influence policymaking in adopting more effective measures to tackle this environmental issue.

Scholars have argued that public opinion plays an important role in shaping government policies. For instance, Burstein (2003) found that heightened public opinion on numerous public affairs issues including social welfare, taxes, and the environment compelled the government to respond. Powlick and Katz (1998) also detected effects of public opinion on foreign policy. Regarding climate change, after Hansen's testimony in 1988, survey results showed 68% of the public had heard about greenhouse effects, a big jump from 38% in 1981. By the end of that year, 32 climate change-related bills had been introduced in the Congress (WorldWatch Institute, 2008). Thus, climate activists have always tried to find ways to influence public opinion to advocate for climate policies.

Climate change scientists found that many factors could affect public opinion on climate change, fueling public skepticism about this environmental issue. Some of them include misinformation about the uncertainty among the scientific community, the technical aspects that prevent lay audiences from gaining a good understanding of the issue, and the government's apathy towards this thorny problem (Lewandowsky, Gignac,

& Vaughan, 2013). The news media, with their role as the primary conduit through which the pubic receives information and learns about science, are also among those whom the scientific community blames (Nelkin, 1995; Wolf & Moser, 2011).

Studies have examined the news media portrayal of climate change, exploring what frames journalists usually use in depicting this environmental problem (Antilla, 2005; Carvalho, 2007; Dirikx & Gelders, 2010; Nisbet, 2009; Trumbo, 1996). But, often, they focused on portrayals at certain time points or ended at analyzing media content, making assumptions of climate change frames' implied effects (Boykoff, 2008; Boykoff & Boykoff, 2004). Other papers sought to understand public awareness of, opinion about, and response to climate change (Kellstedt, Zahran, & Vedlitz, 2008; Leiserowitz, 2005; Lorenzoni & Pidgeon, 2006; Reser, Bradley, Glendon, Ellul, & Callaghan, 2012).

Empirical research has revealed evidence of the effects of media coverage of climate change on public attention to this environmental problem. For example, Brulle, Carmichael and Jenkins (2012) found an association between the attention of media to climate change and public awareness of it. Sampei and Aoyagi-Usi (2009)'s study of Japanese media discovered similar results with the public's perception of the importance of climate change increasing when the volume of news on the issue rose. Arlt, Hoppe and Wolling (2011) found that media usage influenced audiences' awareness of and behavioral intentions regarding climate change. These studies only focused on the amount of coverage of climate change and its association with public attention to the issue. However, climate change is a complex scientific issue. Public perception of it cannot be explained simply by heightened or declining attention, but involves accurate

knowledge of the issue. Identifying which aspects of climate change in the media portrayal of the issue are related to changes in public perception is expected to provide a more nuanced understanding of such a relationship.

The advent of the Internet, and the rapidly evolving digital technologies have unleashed confusions and questions for the news industry. The abundance of news sources allows audiences to exercise their power in either selecting or avoiding the kind of information that they do or do not want to be exposed to (Napoli, 2011). This profound impact of digital technologies on mass media has led some scholars to conclude that the era of powerful effects may have passed. Bennett and Iyengar (2008, p. 708) posit that influence of the fragmented mass media on audiences has "become increasingly difficult to produce or measure in the aggregate." Other scholars (Holbert, Garrett, & Gleason, 2010) disagree with Bennett and Iyengar, arguing that the mainstream media still exert a full range of effects despite sociotechnical changes pervading the media system and democracy. While increasing empirical evidence has offered support to recently enlivened theoretical premises like selective exposure, other evidence from longitudinal studies shows no long-term decline in agenda-setting effects (Lee & Coleman, 2014; Tan & Weaver, 2013).

Whether or not the fragmentation within the media industry itself as well as among the audience will eventually diminish the applicability of such pre-digital age media effects theories as agenda setting remains a question. It is important to note that technology is not the only factor that causes fragmentation within the mass media industry. Ideological and political differences have divided the media as well (Iyengar &

Hahn, 2009; Nie, Miller III, Golde, Butler, & Winneg, 2010). What is less clear is what effects, if any, that fragmentation has on audiences. Finding an answer to this question will provide valuable insights into the ongoing discussion on conceptual aspects of mass media effects research. In order to do that, this study focuses on how climate change, a controversial issue, is covered in partisan media and whether any differences in how it is portrayed influence public perception and behaviors with regard to this environmental phenomenon.

Specifically, the purpose of this study is twofold. First, it investigates media attribute agenda-setting effects on public opinion and behaviors with regards to climate change. It examines such effects through a less common route: compelling arguments, which looks at the transfer of an object's attribute salience on the media agenda to the public salience of that object (McCombs, 2014). So far only a limited amount of research has tested the compelling arguments hypothesis and most often the concept is applied to the study of politics. Thus, this dissertation contributes to the literature of agenda setting, and in particular, the compelling arguments theoretical concept, by assessing the salience of different aspects of climate change in the news media, stepping beyond commonly studied area of political issues.

Traditionally, compelling arguments studies have looked at the relationship between media attribute salience and public issue salience. If an attribute of an object helps transfer the salience of that object from the media agenda to the public agenda, it is considered a compelling argument (Kiousis, 2005; McCombs, 2005, 2013). So far, only Kiousis (2005) has done a study on compelling arguments effects on public attitudes

towards presidential candidates. This is evidence that the concept is much broader theoretically than issue salience, focusing attention on the impact of individual attributes on subsequent outcomes among the public (McCombs, 2014; Ogawa, 2001; Stevenson, Böhme, & Nickel, 2001). This research expands the scope of the compelling arguments concept by investigating the effects of media attribute salience on behavioral (intention to engage in activism) outcomes among the public regarding a controversial public issue, climate change.

Second, this dissertation draws on media polarization and selective exposure concepts, which assumes that people tend to seek likeminded news sources that match their personal beliefs and predispositions (Stroud, 2007). It explores the theoretical intersection between selective exposure and agenda setting. Specifically, it seeks to answer three important questions: (1) What are the differences on the climate change agendas in the media of different ideologies (2) What are the effects of those differences on public opinion and behavior regarding climate change? And (3) What audience factors moderate such effects? In so doing, this study contributes to a growing literature that provides empirical evidence on the interaction of these two major theoretical frameworks in mass communication, through examining the media coverage of climate change as well as its effects on different public groups (Chan & Lee, 2014; Muddiman, Stroud, & McCombs, 2014).

In addition, this research also aims at providing practical knowledge of climate change communication. After years of failing to keep the public informed about and engaged in climate change, scientists and policymakers have begun to realize that simply

communicating facts about this scientific phenomenon will not bring about success in altering the perceptions of either citizens or policymakers. There has been a dire need for a paradigm shift in how climate change should be communicated so that diverse audiences can connect with it. This study serves that practical purpose by providing empirical evidence on which attributes of climate change have a stronger influence on public perception of and behaviors regarding the issue. Thus, functionally it helps scientists and policymakers outline strategies to effectively communicate climate change to and engage intended audiences.

This study relies on two methods. The first includes content analyzing articles and TV transcripts from major print news publications and broadcast channels including *The New York Times, USA Today, MSNBC and Fox News*. These data were used to identify the salience of climate change attributes in the news. The second method uses survey data provided by the Yale University Project on Climate Change Communication. The project has conducted nationally representative surveys on American public opinion on climate change since 2008. The use of secondary data from 2009 to 2014 allows for capturing changes longitudinally in relationships between media content and public views and behavioral intention on climate change.

CHAPTER 2: LITERATURE REVIEW

In this section, I will review the previous literature on the two main theoretical frameworks – compelling arguments and selective exposure – used in this study. I will discuss possible interactions between the two theories, which triggered the theoretical interests I had when starting this study. In addition, I will review the literature on public opinion on climate change as well as political polarization.

Agenda Setting & Compelling Arguments

Derived from Walter Lippmann's (1922) argument about the media's ability to construct social realities in the public mind, *agenda setting* refers to the transfer of the salience of elements in the news media to the public agenda. In the seminal Chapel Hill study, McCombs and Shaw (1972) surveyed voters on the issues they were most concerned about and compared the results with analyses of media content in nine news media used by local voters. The researchers found the issues that voters thought most important correlated strongly with what was emphasized in the news. In other words, the media's attention to a key public issue can influence the public's assessment of importance regarding that issue. Based on the findings, the researchers argued that the media have the ability to transfer the salience of news content to the audience, thus, succeeding in telling us *what to think* about. Since then, this first-level agenda-setting effect has been replicated hundreds of times by researchers around the world (McCombs, 2004).

But an individual object – issue, public figure, or other object of attention – may have numerous attributes. These attributes are characteristics and properties of that object

(McCombs, 2004), defining how the object is seen. Among the many public issues at any point in time, some are made salient by the media. Some are not. The same thing happens to attributes of an object. For example, terrorism is an issue that drew extensive media and public attention after the terrorist attack on September 11, 2001. In examining the media coverage of terrorism, Craft and Wanta (2004) found that some of the attributes of the issue were more salient in the news. Those included length of the war against terrorism, future terrorist attack, effects on economy and Israel – Palestine conflict. Others such as biological threats, air travel safety, war protests or Afghan civilian deaths did not receive much attention. Of those the scholars found significant agenda-setting effects from the media content on the public's perception of the importance of several aspects of the issue including future terrorist attack, effects on economy, Israel – Palestine conflict, and war protests. The findings corroborated the arguments about attribute or second level effects of the media on public opinion. These effects, according to McCombs (2014) are evidence of a thesis that the media can also tell us *how to think about* an object.

The expansion of the theory into the second level, which became solidified in the 1990s, has brought a new theoretical perspective in studying agenda-setting effects (McCombs, 2005; McCombs & Shaw, 1993). First level agenda setting looks at the effects of the sheer volume of exposure to media content. The second-level, however, examines the effects of specific mass media content, hence providing a more detailed understanding of agenda setting (McCombs, 2014).

A substantial amount of research has utilized second level agenda setting to identify the influence of the news media on candidates' perceived attributes in elections. For example, McCombs, Lopez-Escobar and Llamas (2000) found strong correlations between the media and the public agendas on the attributes of the major party candidates in Spain's 1996 general election with a median coefficient of +0.72. Results from other studies have also corroborated these second level effects in researching controversial issues. Kim, Han, Choi and Kim (2012), for instance, detected statistically significant relationships between the salience of certain attributes of the controversy regarding the South Korean government's plan to relocate the country's administrative capital in television news and people's perception of that plan. Incorporating the priming concept, these scholars found that the news media's emphasis on three (i.e. *Balanced development across the nation; Solution to metropolitan problems,* and*; Tremendous relocation cost*) out of five attributes of the issue was also associated with the standards the respondents used to evaluate that plan. In short, these findings demonstrate the relevance of the attribute agenda-setting theoretical perspective to explicating the link between media portrayal of and public opinion regarding such a controversial issue as climate change.

Second-level agenda setting refers to both the substantive and affective dimensions of attributes. *Substantive attributes* are those characteristics of an object that we rely on when we cognitively discern it. For example, Lee (2010) selected five attributes that were frequently mentioned when news media report on climate change. Those included ecosystem, flood, industrial business, energy policy and regional conflict. In his experiment, Lee found a strong correspondence between the respondents'

assessment of attributes of global warming and the salience of these attributes in the texts participants read.

Affective attributes are the facets of news coverage that provoke emotions. In general, the agenda-setting effects of an attribute might be influenced by how that attribute is presented in the news. In other words, whether that attribute is portrayed as positive or negative can affect the audience's perception of it. Wanta, Golan, and Lee (2004) found salient affective attributes of a country in the news have effects on how the public perceives that foreign nation. This study is primarily concerned with substantive attributes of climate change rather than affective.

Attribute agenda setting does not only focus on the transfer of attribute salience from one agenda to another. This theoretical perspective includes two different types of effects. The first type is about the relationship between object attributes on two agendas. For example, the news emphasizes natural disaster, an attribute of climate change, which the public also ranks high in their assessment of its importance among other climate change attributes (e.g. energy issue, economic issues, etc.). So, the transfer of salience is direct from media attribute agenda to public attribute agenda. The second type of effect identifies the link between *object attribute* salience in the media agenda and the salience of *that object* in the public agenda (Ghanem, 1997). For instance, of all the attributes of climate change mentioned in the news, the salience of natural disaster corresponds strongly with the public's perceived importance of climate change issue object. So, the effects cross over from the second to the first level. The latter is conceptualized as "compelling arguments," which will be used as the major theoretical base in this study.

Second-level agenda-setting research can focus on two types of public salience as dependent variables – object salience and attribute salience. The media's emphasis on certain attributes, which belong to an object, could contribute to the salience of those attributes in the public agenda. But, those emphasized attributes could also make the object itself become more prominent in the public agenda. McCombs (2014, p. 51) posits that the conceptualization of the second level was metaphorically based on the inhabitants of George Orwell's fictional *Animal Farm*:

> Some attributes are more equal than other attributes. Some are more likely than others to be regularly included in media messages, and some are more likely than others to be noticed and remembered. In the interpretation of a message some attributes will also be considered more pertinent than others. Certain characteristics of an object may resonate with the public in such a way that they become especially compelling arguments for the salience of the issue, person, or topic.

Extant research has found extensive evidence of compelling arguments. In the very first study that investigated compelling arguments effects, Ghanem (1997) discovered that during the early 1990s the news media in the state of Texas had extensive coverage of crimes. Such attention significantly correlated with public's concerns that crime is the most important issue the country faced. In reality, the actual crime rate in Texas was declining. Of the crime attributes mentioned in the media, two (e.g. *average people would feel threatened about a crime* (+0.78); and *where crimes may actually happen in Texas* (+0.73) saw statistically significant degrees of correspondence with the

concerns of the public about crimes. Ghanem suggested that the salience of these two attributes had influenced public's assessment of the importance of the crime issue, showing a compelling arguments effects. In a more recent study, Saldana, Ardevol-Abreu, Guo, and McCombs (2014) found that seven out of eight attributes individually prominent in the news media were compelling arguments for the issue of the war on drugs.

The compelling arguments hypothesis has been tested in other countries as well. Takeshita and Mikami's (1995) study is an example. In researching the agenda-setting effects of the news media on the public in Japan's 1993 local election, the two researchers discovered significant associations between the news media and voters' agendas for the issue of political reform. Two attributes of that issue, *ethics* and *system restructure* were identified. However, only the later revealed a statistically significant relationship between the two agendas. In this case, *system restructure* is considered a compelling argument.

Theoretically, it has been argued that the compelling arguments hypothesis has further extended agenda setting by integrating this theoretical approach with framing. In Ghanem's (1997) study, two frames of crimes (e.g. *average people would feel threatened about a crime;* and *where crimes may actually happen in Texas*) that were emphasized in the media corresponded with the public's perception of crime as the most important problem. Thus, "compelling arguments are frames" which function as ways to organize and restructure the picture of an object in the mind of the public (McCombs, 2014, p. 92). The concept captures a psychological aspect of the process in which agenda-setting

effects occur. That is, human minds tend to selectively record only a limited number of aspects of an object simply because they cannot pay attention to everything. But these few aspects help make the object accessible in audiences' memories. Whether the attribute images stored in people's minds would lead to further consequences including opinion formation and/or eventually actions require deeper examination. This research takes on that task to investigate the compelling arguments effects of climate change/global warming attributes on the public perception of and behavior with regards to this environmental issue.

Agenda Setting, Public Opinion and Behavior

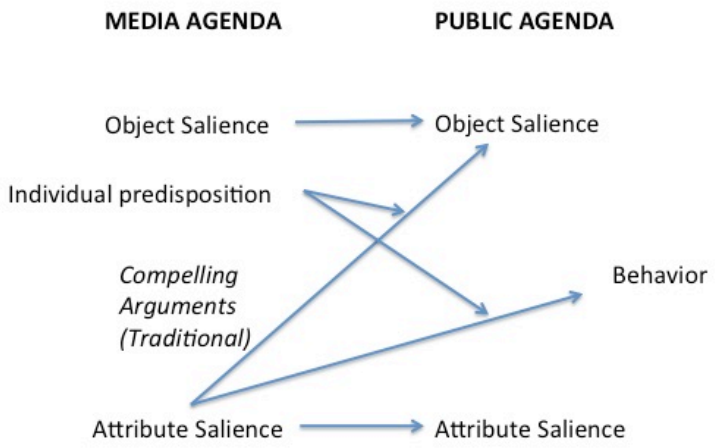
In addition to exploring the perceived importance of issues/objects, a substantial body of research has scrutinized further consequences of agenda setting, linking it with other theoretical concepts to explicate its effects. One of those is priming, which refers to "the process in which the media attend to some issues and not others and thereby alter the standards by which people evaluate" objects or issues in the real world (Severin & Tankard, 2001, p. 226).

The two theoretical frameworks share several common aspects. First, both are concerned with the audience's selective attention to media content. Second, they both rely on salience and accessibility as dependent variables (Willnat, 1997). But while agenda setting centers on salience transfer, priming focuses on the evaluation of objects (i.e. opinion direction) and behavioral consequences (Iyengar & Kinder, 1987; Scheufele, 2000). Perhaps, because of these conceptual similarities, some scholars see priming as an extension of agenda setting (Comstock & Scharrer, 1999; McCombs, 2014). Others,

however, consider agenda setting as a variant of priming (Price & Tewksbury, 1997). Albeit disagreements, the combination of the two approaches presents a stronger theoretical basis for studies looking at the cognitive effects of media attention on audiences (Willnat, 1997).

According to McCombs (2014), although the starting point for research on compelling arguments was the relationship between media attribute salience and public issue salience, the concept is much broader theoretically, focusing attention on the impact of individual attributes on subsequent outcomes among the public. Issue salience is only one of these outcomes. However, to date most compelling arguments studies have examined only the association between attribute and issue salience (McCombs, 2014). Extending the compelling arguments approach, this study integrates the effects of attributes of climate change with the established effects of issue salience and attribute salience on public opinion and behavioral change. With the addition of the 'compelling arguments' link to Box 6.1 in *Setting the Agenda,* we see the relationship of media object salience to public opinion and action engagement as well as the relationship of media attribute salience to public opinion. In other words, this study will theoretically integrate and expand the concept of compelling arguments to behaviors. Whether calling its theoretical framework the combination of compelling arguments and priming or an extension of the scope of compelling arguments empirically, its findings are expected to provide deeper understanding of the effects of media climate change attributes on public opinion and behaviors.

Figure 1: Compelling arguments effects on public object salience, opinion formation and behavior.



Climate Change in the News

Although it is predicted that the effects of climate change will be widespread and serious, the amount of the U.S. news media coverage of this transnational phenomenon has fluctuated. For example, discourse on climate change remained sparse until the summer of 1988, when the U.S. experienced high temperatures and a severe drought, a period which is also termed "the weather scare" (Boykoff & Boykoff, 2004; Carvalho & Burgess, 2005). Other scholars added another reason for this surging trend of coverage of climate change. That is the 1988 testimony to the American congress of NASA scientist James Hansen, who vehemently said that he was 99% sure that the cause of rising

temperature was not because of weather variations, and that burning fossil fuel is the culprit (Boykoff & Boykoff, 2004; Boykoff & Roberts, 2007).

The news coverage of climate change dropped between 1991 and 1996, when the first Iraq War and economic downturn drove media attention away from this environmental topic (Anderson, 2009). Debates on the issue in the news rose in 1997 as the United Nations Framework Convention on Climate Change adopted the Kyoto Protocol, which called for industrialized countries' to commit to reducing greenhouse gas emissions (Boykoff & Roberts, 2007; Leggett, 2001). After that the amount of climate change coverage subsided again. The 2000s saw a gradual increase in news coverage of climate change. In 2006, the release of Al Gore's documentary *An Inconvenient Truth*, helped draw the issue back into the media spotlight (Anderson, 2009).

Climategate, which broke out in the latter half of 2009, had profound impacts on public opinion in subsequent months. The incident involved the revelation of a series of email exchanges, in which climate scientists from two institutions, one in the U.S. and the other in the UK, described the use of a "trick" to hide the declining trend of temperatures. It drew considerable media attention, and quickly became parts of climate skeptics' rhetoric to deny climate change, claiming it a hoax.

What is more serious is that the incident hurt the public's support for efforts to push for policymaking with regards to climate change mitigation and prevention. For example, Leiserowitz, Maibach, Roser-Renouf, Smith and Dawson (2013) found significant declines of belief in climate change, risk perception, and trust in scientists among the American public between the year before (2008) and the year after (2010) that

climategate happened. The loss of trust, according to the results, was significantly higher among politically conservative individuals. Hmielowski, Feldman, Myers, Leiserowitz and Maibach (2013) discovered that conservative media use decreases trust in scientists, and also in certainty of the existence of climate change. As argued earlier, from a media psychology perspective not all media attributes of an issue have equally significant effects on public opinion or behaviors. Thus, a question remains about which aspects of climate change in the media influence the public.

Past research has identified various attributes and frames of climate change. Based on a careful review of the literature, this research uses attributes derived from Liu, Lindquist and Vedlitz (2011)'s study, which content analyzed newspaper articles on climate change from 1992 to 2005. These attributes are divided into four groups, including *Issue Image* (e.g. bad effects and good/no effects); *Issue Remedy* (e.g. Solution/action and no solution/action); *Issue Existence* (e.g. existence and no existence); *Issue Linkages* (e.g. energy – no link to energy, economy – no link to economy, society – no link to society).

1. Issue image (effects) is "the fundamental impression of an issue and has a powerful influence on shaping public understanding and policy agendas" (Liu et al., 2011, p. 383). One of the critical aspects of climate change that has dominated discussions among the public, policy makers and scientists is what effects climate change would have (Kollmuss & Agyeman, 2002; Weber, 2006). Effects of climate change may be either positive of negative. Negative effects include rising seawater, melting polar ice, increasing temperatures, more frequent natural disasters, extinction of species, and health

problems among others. As a complex scientific phenomenon, a common perception of climate change among the mass public is that it is a psychologically distant issue that would not be personally threatening to them (Lorenzoni & Pidgeon, 2006; Spence & Pidgeon, 2010). Hence, highlighting the impacts of climate change and situating it in local contexts would make it more pertinent to the public (Lorenzoni & Pidgeon, 2006). In addition, a common journalistic practice is to encourage dramatization of events, emphasizing their sensational aspects while eschewing comprehensive analyses regarding these problems in order to give problems the energy to be sustained on the news agenda (Bennett, 1996; Boykoff & Boykoff, 2007; Wilkins & Patterson, 1987). Scholars have pointed out that the news media have increasingly portrayed climate change as a threat, focusing on the severe effects that may come as the consequences of it (Hart & Feldman, 2014). However, climate change has also been presented as posing either no harm or having good effects as well (Liu et al., 2011). This is especially logical because some media have been found to hold partisan views (Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012; Hart, 2008). In this study, effects are assessed as two separate attributes including bad effects and good/no effects.

2. Issues Remedy (Solution/Actions): When portraying an issue problem, the news tends to also propose treatments to that problem (Entman, 1993). With regards to climate change, some news content has focused on reporting on *solutions and actions* that would help mitigate the impacts of it, encouraging good practices that enhance social progress (Nisbet & Scheufele, 2009). On the other hand, one of the arguments that deniers of climate change usually use and often get adopted by the media, claims that no

solutions/actions are necessary to tame or mitigate its effects for it is not a real phenomenon. Also, some argue that taking actions to fight climate change would bring about possible reverse consequences such as hurting the economy or businesses (Elsasser & Dunlap, 2012).

3. Issue Existence: The controversy of whether or not climate change exists or is manmade has been pervasive in the media discourse (Feldman et al., 2012). While growing scientific evidence on the existence of climate change has been reflected in the media, the politicization of, and increasing elite and media polarization with regards to the issue, have also kept skeptic voices part of discussions as well (Boykoff, 2013). For example, dismissive language has been found to be more apparent in Fox News' content compared to CNN and MSNBC (Feldman et al., 2012).

4. Issue Linkages: Climate change impacts are predicted to be widespread, influencing broad socio-economic issues (Nisbet, 2009). As such, it has often been portrayed together with such issues as energy, economics and broad social concerns. Making these links salient or downplaying them in media content may influence public perception of climate change.

Using the aforementioned attributes, this study asks:

RQ1: Which attributes of climate change are salient in the news?

At its core, the agenda-setting concept is fundamentally based on the assumption that the news media agenda is homogeneous, which provides members of the audience with similar news experiences (McCombs, 2014). However, recent changes in the media

industry have fueled an argument that the media has been increasingly fragmented. For example, Iyengar and Hahn (2009) contended that several decades ago, before the advent of cable TV and subsequently the Internet, the majority of the American public got their news from one of big three network TV stations. Newscasts offered by these TV channels as well as reports from daily newspapers provided similar and generic perspectives on the news. But the widening political partisanship has split the U.S. media into two distinct turfs of "red" and "blue" or conservative and liberal. In this same line of thought, other scholars argued that as the fragmentation in the news industry and the public accelerated a homogeneous news agenda may no longer exist (Sustain, 2008; Bennett & Iyengar, 2008), thus leading to the demise of agenda setting.

Some media researchers, on the other hand, contended that despite partisanship and diverse media choices made possible by digital technologies, the homogeneity of the news media agenda remains unchanged (Yu, 2005), hence members of public still share similar news experiences (Lee, 2009). Most studies in this area, however, have investigated changes in the media agenda using a broad array of public issues, with many of them still receiving consensus among news outlets and the public. This research, for the most part, suggests that the diversity of the news media agenda does exist, but perhaps only at the attribute level, especially if we examine news content on an individual issue that is highly controversial. To provide empirical evidence for this, this dissertation examines the differences in the attribute agenda of climate change among ideological media. It predicts that:

H1a: Conservative media will be more likely to emphasize dismissive climate change attributes than liberal and middle ground media.

H1b: Liberal media will be more likely to emphasize accepting climate change attributes than conservative and middle ground media.

Public Opinion on Climate Change

Although scholars believe that climate change has a wide range of local, national, and international effects (Nisbet & Myers, 2007), poll results demonstrated that American public has increasingly been aware of global climate change. In 2001, 12 years after Hansen testified in the congress about the existence of global warming, 82% of the American public had heard or read about global warming (PIPA, 2003, cited in Leiserowit, 2005). However, public opinion on this issue has shown fluctuations over past decades.

According to Gallup poll results, in 1989, 48% of the American public believed the effects of this environmental phenomenon were already happening. This figure rose to its peak in 2008, when Al Gore released his well-known book: *An Inconvenient Truth*, standing at 61%. But it again dropped to 49% in 2011, and has grown steadily to 55% in 2015 (Saad, 2015). Nisbet and Myers (2007) analyzed U.S. polls on climate change for 20 years from 1986-2007 and found that the number of people who saw global warming as a personal problem had increased steadily over time from 27% in 1997 to 52% in 2007. Results from more recent studies revealed that after 2008, public concern over climate change fell again. Gallup Poll surveys found that the number of American people

who worried "a great deal" about climate change dropped from 41% in 2007 to 28% in 2010 and 25% in 2011 (Newport, 2014). As public perceptions can compel or hinder political, economic and social action to address particular risks, the fluctuations in climate change perceptions have influenced how public policies regarding this environmental phenomenon as well as climate change adaptation and mitigation measures are shaped (Lorenzoni & Pidgeon, 2006; Leiserowitz, 2006).

Many factors could shift public attention away from climate change. For example, Leiserowitz et al. (2013) posit that the climategate incident in 2009 had significant effects on the public's understanding and concern about global warming. According to their findings, in 2008, a year before the incident occurred, 71% of Americans said "yes," global warming is happening. In 2010, this number fell to 57%. Meanwhile, the number of people who did not believe that global warming was happening doubled over the two years period from 10% to 20%. In addition, in 2008, 57% of respondents said human activities were causing climate change. By 2010, this number dropped 10 points to 47%. In between 2008 and 2010, the public's worry about climate change saw a sharp decline. Specifically, by 2010, 50% of Americans said they were "somewhat" or "very worried" about climate change, falling 13 points from 63% in 2008. These changes in public opinion, according to the scholars, were the effects of the notorious climategate.

Besides the effects of personal factors such as gender (McCright, 2010), race (McCright & Dunlap, 2011) or political ideology (Leiserowitz et al., 2013) scholars have also discovered other factors that could play important roles in public opinion on climate change. For instance, after examining 22 years of public opinion data in the U.S., Scruggs

and Benegal (2012) suggested that economic insecurity had driven the decline in belief about climate change. The two scholars found strong correspondences between the percentages of the American public saying climate change was occurring and the unemployment rates and inflations over the period. Others contended that local weather variations could also affect the public's political attitude with regards to climate change (Egan & Mullin, 2012).

Among those factors, media coverage of climate change has been found to exert strong influence on public opinion on climate change. For example, new reports on the climategate in 2009 scandal contributed to the decline in public understanding and perception of climate change (Leiserowitz et al., 2013). In another study, Brulle, Carmichael, and Jenkins (2012) identified that during the period from 2002 to 2010 these included public access to accurate scientific information, elite cues, and movement/ countermovement advocacy. The news media's coverage of climate change, according to their findings, was a strong predictor of public opinion on this environmental phenomenon. Brulle, Carmichael, and Jenkins focused on the first level of agenda setting, which focuses on the transfer of media salience of climate change from the news' to the public's agenda.

However, as a complex issue with different and, in many cases, contrasting views about it, examining how climate change is portrayed in the media and, specifically, which aspects of it influence public opinion is expected to provide a more nuanced understanding of media effects with regards to this issue. This research is not interested in the direct transfer of salience from the media attribute agenda to the public attribute

agenda. Instead, it focuses on compelling arguments effects, which are concerned with the impact of media attribute salience on the salience of climate change as an issue on the public agenda.

Mounting evidence in climate change research has demonstrated that the majority of the public still perceives climate change as a distant issue rather than a personal threat, which, scientists believe, is hindering climate change mitigation and adaptation efforts. Poll results have also shown fluctuations in public opinion on the importance of climate change. And scholars have long blamed the news media for biased reports on climate change, which influenced how much policy support the public shows for this issue (Hart, 2011; Boykoff & Boykoff, 2004).

With regards to agenda setting, Kim et al. (2012) pointed out that how media cover an issue – highlighting or downplaying certain attributes of an issue, influences public opinion on that issue. In their study that examined attribute agenda-setting effects on Korean public opinion regarding the government's plan to relocate the country's administrative capital, Seoul, Kim and his colleagues (2012) discovered the salience of certain attributes of the issue in the media agenda (i.e. *Balanced development; Solution to metropolitan problems;* and *Stimulating the local economy*) positively predicted the public support for the plan. Another (*Tremendous relocation cost*) saw a negative association with that support.

Research in mass communication has identified a strong link between news media consumption and political activism and participation. For example, Becker, Dalrymple, Brossard, Scheufele and Gunther (2010) discovered that attention to news regarding stem

cells motivates audiences to engage in actions regarding this controversial issue. Specifically, those who consume news on stem cells would be more likely to join a demonstration, sign a petition, take part in public discussions or hearings, contact an official to express their views, or write a letter to the editor. Numerous other studies detected the relationship between news use and civic participation (Boyle & Schmierbach, 2009; Kang & Kwak, 2003; Shah, 1998). These testified to the effects of news on audiences' political action engagement.

As one of the most widely used theories in the field of mass communication, agenda setting has been applied in hundreds studies to investigate the effects of news content on public opinion. However, to date, limited amount of agenda-setting research has utilized this theoretical framework in researching the influence of news content on public intention to engage in issue participation. This study fills that void through examining the association between how the media cover climate change and changes in public behavioral intention including "(1) write letters, email, or phone government officials about global warming, and (2) volunteer with or donate money to an organization working to reduce global warming." In order to do that, this research employs the compelling arguments concept as its theoretical groundwork to explicate these associations. Thus, it asks:

> RQ2: Which of the various attributes of climate change found in news coverage function as compelling arguments for:
>
> - (RQ2a) salience of climate change in the public agenda?

- (RQ2b) participating in activism?

Public Political Polarization

Polarization among the public is not new. Empirical analyses demonstrate that since the 1970s it has increased dramatically, intensifying political partisanship between Republican and Democrat and widening the ideological divide between liberal and conservative Americans (Abramowitz & Saunders, 2008). Disagreements also arose among political scientists on whether or not the ideological or political party divide is systematic which implies divergence among the mass public on a broad set of issues or it reflects only a split on a consistent set of public issues (Abramowitz & Saunders, 2008; Baldassarri & Gelman, 2008; Fiorina, Abrams, & Pope, 2005; Shapiro & Bloch-Elkon, 2006). No matter which, escalating partisanship among the public does have both healthy and detrimental effects on America's politics. Its beneficial impacts include interest in political issues and activities by highly partisan citizens in acquiring political knowledge and in participating in political actions. It has also, on the other hand, worried political pundits, for numerous reasons including alienation and political dormancy especially where consensus is sought to push for changes in public policies (Doherty, 2014; Prior, 2013; Stroud, 2007).

Ideological divide among the mass public can be found on a number of contentious issues. For example, party identification was detected to be a predictor for the split of the public's views on U.S. foreign policy concerning the Iraq War (Jacobson, 2010). Henderson and Hillygus (2011) reported a stronger likelihood of opposing universal healthcare insurance policies among Republican between 2008 and 2010. In

their longitudinal study, Abramowitz and Saunders (2008) detected a sharp divide along the party lines on several public issues including (1) aid to Blacks; (2) abortion; (3) jobs/living standards; (4) health insurance, and; (5) presidential approval.

Much like many other controversial issues, since its emergence on the national agenda, climate change has seen a sharp divide either ideologically or along party lines. For example, McCright and Dunlap (2011) observed that Democrats' and liberals' belief is closer to scientific consensus about this environmental phenomenon than that of Republicans and conservatives. Liberals and Democrats are also more likely to express concerns about global warming/ climate change than Republicans and conservatives do. According to the results from a recent national survey by the Pew Research Center (Pew Research Center, 2015), 76% of liberals say human activities cause climate change, while only 29% of conservatives believe so.

Of the many factors that cause the division in public opinion (e.g. the nature of the U.S. political system with two major political parties or disagreements among political elites), media have been found to contribute to mass polarization, leading the American public to support partisan views on many political issues (Levendusky, 2013). Stroud (2010) contends that exposure to consonant media messages could increase public's polarization. She discovered that those who identified themselves as conservative Republican and liberal Democrat actively seek to expose themselves to likeminded media content, thus causing increased polarization. She discovered that those who identified themselves as conservative Republican and liberal Democrat actively seek

to expose themselves to likeminded media content, thus causing increased polarization among the public

A number of studies on media and public polarization have been based on the theoretical concept of selective exposure, which emphasizes the role of individual preferences in choosing media content and its subsequent effects. With regard to climate change, scholars have begun to investigate the effects of partisan media on different public groups. For example, based on the findings of their recent study testing first level agenda-setting effects on partisan publics, Zhao, Rolfe-Redding and Kotcher (2014) reported a significant correspondence between the volume of news coverage of climate change in partisan media and concerns about this environmental issue among partisan publics. Interestingly, the significant correlations were negative for Republican, but positive for Democrat, which means Democrats' concerns about climate change increase when media attention to the issue increases; in contrast, Republicans' concerns decrease when the media pay more attention to climate change. Such findings provide empirical evidence about how individual differences moderate the effects of agenda setting. However, as argued earlier, not all aspects or attributes of climate change in the media would exert equal influence on public opinion. Taking a further step to investigate the compelling arguments effects of media climate change attributes on partisan publics is expected to show a more intricate picture about what moves public opinion and actions. This study asks:

RQ3: Which of the various attributes of climate change on the media agenda have compelling arguments effects on partisan publics (i.e. conservative and liberal)?

In the new media environment, news consumers can seek information that is congruent with their views, and recent research has investigated how active people are in selecting likeminded information (Feldman et al., 2012; Jang, 2013; Stroud, 2010). While selective exposure posits that individuals' views or preferences lead their control of what to expose to, agenda setting is more concerned with media effects on audiences at an aggregate level. In other words, the first assumes complete – or at least, high – control by the audience in information exposure; the later contends that the media content is pervasive and homogeneous – media effects therefore tend be more similar across public groups. As the media environment is still in transition, where new media do allow individual selectivity, but mainstream media have been found to still have strong effects (Shehata & Strömbäck, 2013), perhaps an intersection between the two theoretical frameworks would be theoretically and realistically sound. Zhao et al. (2014) found stronger first level agenda-setting effects of climate change coverage in partisan media on partisan publics. To operationalize this theoretical assumption, this study investigates compelling arguments effects of ideological media on ideological publics:

H2a: Compelling arguments effects, if any, of climate change attributes from partisan media will be strongest on respective partisan publics (i.e. liberal media and liberal public; conservative media and conservative public).

In the groundbreaking Chapel Hill study, McCombs and Shaw (1972) tested the media agenda-setting effects on undecided voters, with the assumption that this group might be swayed by the media more easily. Although undecided voters are not the same as people who identify themselves as independent, the two may share some similarities, that is, people who are not leaning to either side might be influenced by the media the most. Based on this logic, this research hypothesizes that:

> H2b: Compelling arguments effects, if any, from both independent and overall media will be strongest among the independent public.

Uncertainty has been found shadowing discussions regarding climate change since its emergence as a public issue in the national agenda. For the public, uncertainty with regards to climate change means a lack of evidence of about its existence, what would be the cause of this environmental phenomenon as well as its effects (Weber & Stern, 2011). For example, results from the latest Gallup poll survey, which was conducted in 2015, reveal that only a little more than half (55%) of Americans believe climate change is already happening. According to the survey 41% of the American public said natural variations cause climate change and that the increases in the earth temperatures have nothing to do with human activities. Two in every three Americans said climate change will not pose a serious threat in their lifetime and the issue has generally been exaggerated (Saad, 2015). Such skepticism has fueled the division within the public, preventing any climate change policies from reaching the mass' consensus.

Reasons for the public's climate change skepticism are many. Patt and Schrag (2003) assert that how climate change information is communicated to the public using

the scientific discourse may influence their cognition as well as belief in the issue. For example, scientists often talk about climate change or other scientific issue using the language of probability, which presents uncertainty about the existence, causes and consequences of climate change. The scholars posit that this uncertainty can influence the public's perception of climate change.

Another important factor that could shape public belief in climate change is the public's personal experience with effects of this environmental phenomenon. Climate change itself is an intrinsically difficult science to understand. Greenhouse gases, which are its main causes, are invisible. Its effects, in many cases, are geographically and temporally distant (Weber & Stern, 2011). This has made it harder for people without personal experience with climate change to relate to it. Scholarly research has found that public groups with short-term weather experience such as with floods or heat waves tend to have stronger belief certainty in the existence of this environmental phenomenon (Hamilton & Stampone, 2013; Weber, 2006). Others have also identified such personal factors as worldviews (Weber & Stern, 2011), trust in informants (Krosnick, Holbrook, Lowe, & Visser, 2006), or exposure to media messages which falsely present climate change as an issue scientists still disagree about (Zehr, 2000; Leiserowitz et al., 2013).

According to scholars, climate change skepticism or belief certainty has important implications on public perception, attitudes and actions towards this issue. It could also affect public policies on climate change. In their experiment, Corner, Whitmarsh and Xenias (2012) discovered that skepticism or belief certainty caused attitude polarization about climate change among the public. Heath and Gifford (2006) found that the belief

that the world is fragile influences people's willingness to engage in actions to mitigate climate change. O'Connor, Bord and Fisher (1999) identified the relationship between belief in the reality of climate change and voluntary actions including effective use of transportation and energy saving. These findings suggest that belief certainty could be a contingent factor for compelling arguments effects on climate change salience on the public agenda and their intentions to take action on climate change. Thus, this study predicts:

> H3: Belief certainty will influence the compelling arguments effects, if there are any, between media agenda and:
>
> (H3a) the salience of climate change on the public's agenda.
>
> (H3b) the public's intention to engage in activism.

A substantial amount of research has examined the influence of news sources on the way media messages are communicated to the public. For example, Lasorsa and Reese (1990) contended that different types of sources gave distinct perspectives to news content regarding the stock market crash in 1987. Although they did not examine the effects of source use on audiences, in discussing their research's implications, the authors argued that such usage would have shaped public views on the incident.

From an attribute agenda-setting perspective, the effect of an attribute on public opinion can be different depending on which news sources mention that attribute. Son and Weaver (2006), for example, found that attributes of candidates in the U.S. presidential election in 2000 had stronger influence on candidates' public poll standings when they were present in reporters' analyses or polling reports than when mentioned by

the candidates themselves, members of a candidate's party, or members of the competing party. These findings suggest that source types can impact the predictability of news attributes influence on the public. Taking this approach further, the present research asks:

> RQ4: Which news sources influence the relationships between climate change attribute salience in media and the public's issue salience and intention to engage in activism?

CHAPTER 3: METHOD

This study uses two kinds of data, content analysis and survey, for its purpose of understanding the attribute agenda-setting effects on public opinion of news coverage about climate change.

Survey Data

I use secondary data obtained from a series of nationally representative surveys managed by the Yale University Project on Climate Change Communication. The project, since its inception in 2008, has so far conducted 13 surveys in total. However, this dissertation included only 10 waves for several reasons. The first two waves were two halves of a survey with a questionnaire that was broken into two parts because of its length. Another wave, which was conducted in 2011, was a re-contact of the first two surveys. Basically, this survey and the first two waves were a panel. For that reason, they were excluded from this study.

All of the surveys were conducted online by Knowledge Networks on Americans 18 years or older representing the country's population. Participants recruited in these surveys were randomly sampled from a 50,000-member online panel maintained by Knowledge Networks, which created the panel using random digit dialing and address-based sampling. This allowed the company to reach participants who have both listed and unlisted phone numbers and telephone, non-telephone, and cell phone–only households. In addition, Knowledge Networks also provided free Internet service and a netbook to

participants who did not have computer or Internet access. Participants typically received an incentive of $4 to $6 in return for completing two 5- to 20-minute surveys per month.

The 10 surveys used for this study were completed during the five years between 2010 and 2014 with two independent surveys being launched each year. The average number of respondents participating in each survey is 1,146 (See Table 1). The completion rates ranged between 47.1% and 60.9%. The cumulative response rates were between 4.2% and 7.1%.[1]

Table 1. Information on survey waves

Survey	Date	Number of respondents	Completion Rate	Cumulative Response rate
W1	12/24/09 – 01/03/10	1001	52.1%	5.8%
W2	05/14/10 – 06/04/10	1024	59.7%	7.1%
W3	04/22/11 – 05/11/11	1010	60.9%	6.3%
W4	10/20/11 – 11/16/11	1000	66.5%	6.2%
W5	03/12/12 – 03/30/12	1008	65.8%	5.7%
W6	08/30/12 – 09/12/12	1061	54.1%	5.2%
W7	04/08/13 – 04/13/13	1045	47.1%	4.2%
W8	11/23/13 – 12/09/13	1657	48.0%	4.2%
W9	04/11/14 – 04/21/14	1384	56.5%	5.1%
W10	10/14/14 – 10/28/14	1275	57.4%	4.9%
Total		**11,465**		

[1] Cumulative response rate = recruitment rate x profile rate (those who completed questions about their demographic profile/ those who initiated their answer with or without completing questions about their demographic profile) x completion rate (DiSogra, 2009).

DEMOGRAPHICS OF SURVEY PARTICIPANTS

Of the overall 11,465 participants, 49.6% were male and 50.4% were female. Respondents' education was measured by four categories: *Less than high school* (8.3%); *High school* (29.6%); *Some college* (29.8%), and; *Bachelor's degree or higher* (32.4%). The household median income for all waves was between $60,000 and $74,000. Participants' ages were assessed with four categories: 18-29 (15.3%), 30-44 (25.3%), 45-59 (30.9%), and 60 or older (30.3%). In terms of race, of the 11,465 respondents, 8,731 (76.2%) were *White/Non-Hispanic;* 1,094 (9.5%) were Hispanic; 964 (8.4%) were *Black/Non-Hispanic*; 345 (3%) identified themselves as *Other/Non-Hispanic*; and 331 (2.9%) were of the *Two Races/Non-Hispanic* group.

Content analysis

I first chose six publications for content analysis. They included *The New York Times, USA Today, New York Post, MSNBC, ABC*, and *Fox News*. Of the six *The New York Times* and *MSNBC* represented liberal media. *The New York Post* and *Fox* were conservative. *USA Today* and *ABC* represented middle ground media. The selection criteria were based on several aspects. First, I used Stroud's approach (2011) which takes presidential candidate (dis)approval to identify whether a news publication is conservative, liberal or middle ground. In the most recent two presidential elections *The New York Times* endorsed Obama while *The New York Post* endorsed Republican candidates. *U.S.A Today* chose not to endorse either side. In addition, according to previous studies, the three broadcast channels represented three positions in the

ideological scale (Feldman, et al., 2012; Groeling, 2008; Morris, 2007; The American Presidency Project, 2012).

However, not all these media were keen on reporting on climate change. For example, during the three months between December 11, 2011 and March 11, 2012 (Wave 5) *The New York Post* published only six stories about climate change. The numbers of articles for this wave were 39 for *The New York Times* and 16 for *USA Today*. Another example is *ABC,* which broadcast only five reports about global warming/climate change between January 21 and April 21, 2011 (Wave 3). During this period, 22 transcripts were retrieved from *MSNBC* and 18 from *Fox News.* So, to maintain the balance between all the publications, I decided to include only articles from *The New York Times* and *MSNBC* for liberal media, *USA Today* for middle ground and *Fox News* for conservative media.

The time frame for the content analysis was three months prior to the launch of each survey. For example, the first survey was conducted between December 24, 2009 and January 3, 2010. So, all articles from September 23 to December 23 that year were collected from the four media. In previous agenda-setting studies, the selected amounts of time for media coverage ranged from one week to nine months (Atwood, Sohn & Sohn, 1978; Wanta, Golan & Lee, 2004). Watt, Mazza and Snyder (1993) found that the time for issue salience memory to decay is 300 days. With that, the selection of media coverage of three months prior to each survey in this study was within that range. With an eye to be not only comprehensive, but also tightly focused, the search terms included

three keywords "*climate change*," and/or "*global warming*," and/or "*greenhouse gas*" either in the lead paragraph or headline of the articles for newspapers publications.

A different procedure was used for television transcripts. From the experience of the author, television transcripts are usually filed into the database with various pieces of news in one show. The keywords "*climate change*," "*global warming*," or "*greenhouse gas*" might not be included in the lead paragraph or in the headline although there was a report on climate change in the show. Thus, instead of looking for these keywords in the headlines or lead paragraphs, I searched full-text. Transcripts that contained any of the three keywords were gathered.

Searches were performed using the *LexisNexis* database. After excluding duplicates, blog posts, corrections, book and movie reviews, articles for the international version of a publication, and letters to the editor, these search terms yielded a total of 931 articles about climate change from *The New York Times* and *U.S.A Today* over the 30 selected months. For TV transcripts, because I did full-text searches on all shows in *LexisNexis* for the two channels, all transcripts were assessed carefully to ensure they had at least one climate change attribute in each report. After eliminating lead-ins, duplicates, as well as reports that mentioned climate change in passing without the presence of any attributes, I retrieved a total of 592 transcripts from the two broadcast channels about climate change that mentioned at least one climate change attribute (See Table 2). In this study, I used both editorial pieces and news reports from newspapers, and all shows that were broadcast during the selected periods of time on the two television channels. The inclusion of editorials and television talk shows is expected to provide a more thorough

examination of the media agenda. Extant literature found that media publications use similar strategies for editorials as they do for news stories in order to frame or demonstrate their agenda with regards to a particular issue (Ryan, 2001), especially for such a highly contested topic as climate change (Elsasser & Dunlap, 2012). For this study, which includes examining the differences in the agenda of partisan media and their influences on partisan publics, the inclusion of editorials is important to provide an accurate picture of climate change in the media agenda.

Table 2. Number of articles by wave

Wave	New York Times	USA Today	MSNBC	Fox
W1	141	47	33	52
W2	44	13	27	20
W3	45	28	22	18
W4	41	26	23	24
W5	39	16	14	21
W6	38	25	24	16
W7	62	28	50	42
W8	78	28	23	19
W9	68	28	40	30
W10	110	26	48	36
Total	**666**	**265**	**304**	**288**

CODING PROCEDURE

In order to develop the codebook, I first immersed myself in the qualitative coding of about 50 randomly selected articles. Cues for coding each attribute were identified and

included in the codebook. These attributes are grouped into four larger groups: Issue Image, Issue Existence, Issue Remedy, and Issue Linkages (Liu et al., 2011). Each time an attribute was mentioned in the text, it was counted once (See Table 3 for details).

The codebook contains 34 items, including general information on the articles (e.g. publication, wave), 12 specific attributes defining the four groups (e.g. Bad Effects, No Effects, Existence, No-Existence, etc.), and sources mentioning attributes (e.g. politician, reporter, scientist, etc.). The complete codebook is in Appendix A. Two graduate students were hired to code the materials. After becoming familiar with the codebook through extensive training, coders were assigned 200 of the same articles (13%) to code for inter-coder reliability. Coders were instructed to look for the presence of the 12 attributes in texts, which were grouped in four large categories including Issue Image, Issue Solution, Issue Existence and Issue Linkages. Codebook was adapted from a previous attribute agenda-setting study on climate change by Liu, et al. (2011). Inter-coder reliability tests found satisfactory results. Cohen's Kappa values ranged from 0.75 to 0.93 (See Table 3).

Table 3. Coding scheme and inter-coder reliability results

Variables	*Cohen's Kappa*
Issue Image	
Bad-Effects: Explicitly mentioning negative consequences of climate change/global warming/global warming/ global warming (e.g. 'environmental disaster,' 'health risk,' 'loss of life,' 'threat to infrastructure,' 'land degradation,' 'greater severity and frequency of tropical storms,' 'drought,' 'extreme weather,' 'snow storm,' 'glacier melting,' 'polar bear extinction,' 'rising see level,' 'influencing water resources,' etc.)	0.88
No-Effects: Explicitly stating climate change has no harm. Denying all possible effects that are often associated with climate change/global warming/global warming. Indicating good effects brought about by climate change/global warming/global warming, ('climate change is not a threat to the earth or human kind,' 'global warming helps agriculture,' 'we need global warming in cold area,' etc.)	0.78
Issue Solution	

Table 3 (continued)

Solution: Proposing solutions to mitigate, prevent or adapt to climate change/global warming (e.g. 'cutting greenhouse gases,' 'adapting to climate change by forest growing,' 'using alternative energy like solar, wind to avoid warming the earth,' 'new policy to curb emission,' etc.). Stating that countries need to work together to fight climate change; ('UN conferences on climate change; the U.S. should make stronger commitments to international climate change initiatives'; 'climate change treaty will engage more countries in the world. in the world'; 'India and China promised to cut greenhouse gases,' etc.)	0.84
No-Solution: Explicitly mentioning that no solution is needed or is helpful in climate change mitigation, prevention, or adaptation. Adopting other solutions will be more helpful than investing in mitigating global warming, (e.g. 'there is nothing human can do about climate change,' 'solar energy cannot replace coal to cut greenhouse gas,' 'investing in clean energy is expensive,' 'cutting greenhouse gases will slow down the economy,' 'no country is doing anything to cut greenhouse gases,' etc.); Mentioning that no cooperation is effective or needed for climate change, (e.g. countries in the world are withdrawing from climate change treaty; no countries are doing anything to mitigate climate change; international conferences discussing climate change/ global warming do not reach their goals, etc.)	0.76

Table 3 (continued)

Issue Existence	
Existence: Mentioning that climate change/global warming does exist, and/or human causes climate change/global warming. Reporting scientific evidence of climate change. Stating that a person approves of/supports/believes in climate change, that means the person thinks climate change/global warming exists.	0.80
Non-Existence: Stating that climate change/global warming does not exist, and human does not cause climate change/ global warming. Mentioning that a person disapproves of/ disbelieves in climate change, that means the person think climate change/global warming does not exist (e.g. human make no effects on temperature increase; there are not enough facts about climate change; climate change is made up by liberal conspiracy; global warming is a hoax, a scam; global warming is in doubt, etc.)	0.83
Issue Linkage	
Energy: Climate change bill may influence the country's oil production; climate change forces us to resort to other types of energy such as wind or solar; climate change mitigation efforts will influence oil/electricity prices.	0.77
Non-Energy: Climate change/global warming is not linked to energy, (e.g. coal does not generate as much emission as other types of energy; we have consumed as much energy as before, why should we be worried, etc.)	0.76

Table 3 (continued)

Economy: Mentioning climate change/global warming in association with cutting tax, green job, more profit, loss in profit, etc. (e.g. Economic crises de-prioritize climate change; Companies benefit from higher electricity prices because oil prices will go up to offset the cost of climate change mitigation or prevention; Businesses will be affected by climate change policies; Coal industry will be hurt if we cut carbon emission; Food supply is short because of disasters etc.)	0.76
Non-Economy: Climate change/global warming has no link to economy, (e.g. mitigating climate change will not have adverse effects on the economy; Economy will not be hurt by adapting to climate change, etc.)	0.77
Society: Social, health and education problems are linked with climate change/global warming, (e.g. more conflicts, crimes, health issued are caused by climate change/global warming; social issues such as migration, population displacement, poverty are directly associated with climate change/global warming; whether climate change/ global warming issue should be taught in school; the public should be educated about global warming, etc.)	0.77
Non-Society: Climate change/global warming has no link with social issues; (e.g. climate change/global warming should not be taught in school; there is no need to educate the public about greenhouse gases; health problems have nothing to do with climate change/ global warming; conflicts and crimes are not associated with climate change/ global warming, etc.)	0.75

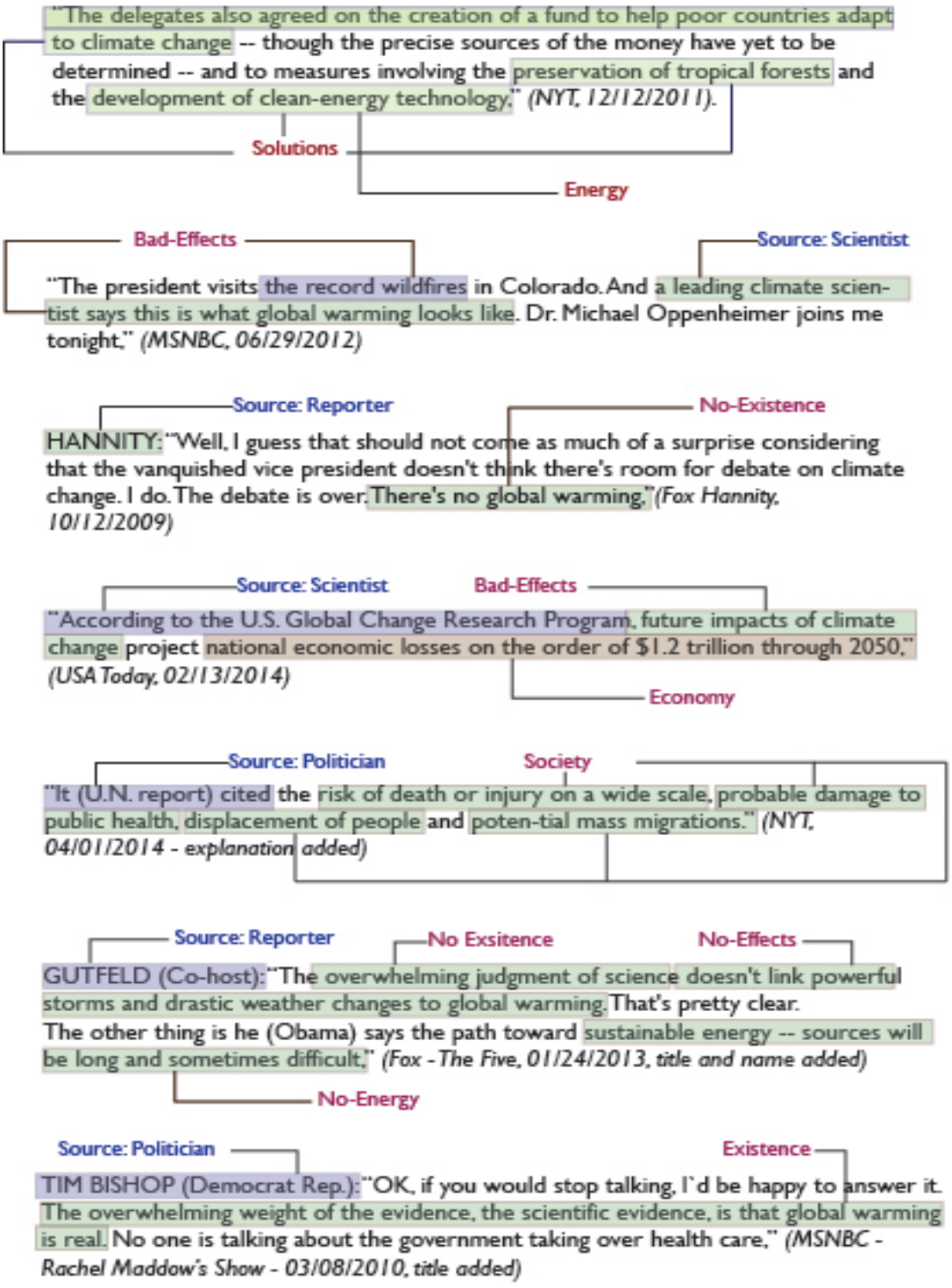
Table 3 (continued)

Other: Climate change/ global warming is linked with issues other than the aforementioned.	0.93

Coders also were instructed to code for sources that mentioned each attribute. I used seven categories including scientist (e.g. scientist, scientific study, research institution) politician (e.g. politician, report, press releases by political institution), business people, activist, regular people, reporter, and other. These source categories were adopted from Son and Weaver's study (2006) but were modified to suite the nature of source use for climate change news. For example, Son and Weaver used candidates as a type of source because their study focused on the agenda-setting effects of news on public opinion. This study did not use that source category. However, it included the scientist category because climate change is a scientific issue.

After coders identified sources, they also coded for the sum of attributes mentioned by each of the sources. For example, if in a story, ***Bad-Effects*** is mentioned five times, with a scientist speaking of it two times, while the reporter mentioning it three times, the number two will be assigned to the scientist category; and the number three will be assigned to the reporter category (See Figure 2 for coding examples). Results of Cohen's Kappa tests showed acceptable levels of intercoder reliability, which ranged between 0.75 and 1 (See Table 3).

Figure 2: Sample coding



Measurement of the Variables

For the independent variables, the salience of the attributes of climate change was assessed by summing the number of times each attribute was mentioned in the media for the three months before each survey was conducted. The sums of attribute mentions in text by sources were also recorded to investigate the influence of sources.

For the dependent variables, the public salience of climate change was measured by answers to three questions in the surveys:

(1) "How worried are you about global warming?" (1 = not at all; 4 = very);

(2) "How important is the issue of global warming to you personally?" (1 = not at all; 5 = extremely) and;

(3) Here are some issues now being discussed in Washington, D.C. [Global warming was one of the issues asked about]. Do you think each of these issues should be a low, medium, high, or very high priority for the next president and Congress?

This measurement of salience allow for capturing several aspects of the public issue salience including their national interests and personal concerns about the issue (McCombs, 1999).

Unlike the first and third questions, which were both on 4-point scales, the second one was a five-point scale. Therefore, I converted it into a four-point using the formula: new-X = 3/4* old-X + 1/4. This transformation turned all values of 5 in the old variable to 4, and 1 remained 1.

I used Cronbach's Alpha to test for internal consistency among the three public salience variables. Results suggested an acceptable level of consistency with a coefficient

of 0.87. I then combined the three variables using the formula: New public salience = Mean (V1+V2+V3). Across the 10 waves, this new variable has a mean of 2.26 (SD = 0.84).

The activism measure was created by combining two items asking respondents about their intention to engage in the following actions over the next 12 months: (1) Write letters, email, or phone government officials about global warming, and (2) Volunteer with or donate money to an organization working to reduce global warming. Respondents were asked to rate their intention on a three-point Likert scale (1 = less often, 2 = about the same, and 3 = more often). Pearson's correlation tests were performed on the two variables. Results showed a significant association between them (r = +0.72, $p < 0.01$). They were then added together and divided by two. The index had a mean of 1.93 (SD = 0.53).

Political ideology was assessed on a 5-point scale ranging from 1 = very liberal to 5 = very conservative (Mean across 10 waves = 3.18, SD=1.05). For the purpose of this study, political ideology was divided into three groups: Liberals (N = 2,614) are those who chose two response options 1 = very liberal and 2 = somewhat liberal; Independents (4,523) identified themselves as 3 = moderate or middle ground, and; Conservatives (4,023) include those who saw themselves as 4 = somewhat conservative and 5 = very conservative. Across the 10 waves, 305 respondents either refused to answer or skipped this question.

Belief certainty was measured by asking respondents about how sure they are that global warming is happening. Response includes four options: 1 = not at all sure; 2 =

somewhat sure; 3 = very sure, and; 4 = extremely sure. For this study, this variable was transformed into two groups: Low certainty consists of answers saying that respondents are "not at all sure" and/or "somewhat sure" about the existence of global warming. High certainty, on the other hand includes all responses of those who thought they were "very sure" or "extremely sure" that climate change or global warming is happening.

Data Analysis

The unit of analysis in this study is waves instead of individual articles or respondents. Without the presence of a media use variable in the surveys, which did not allow for merging the content with the survey data, I created a "secondary" database that contains both content analysis and survey data. For each wave, the mentions of attributes in the media were summed to measure these independent variables. For example, in Wave 1 or during the three months between September 23 and December 23, 2009 (The survey for this wave was conducted on December 24, 2009) there were a total of 273 articles from all four media outlets about climate change, which mentioned the solutions for climate change 435 times. This value of 435 was entered as representing the ***Solution*** attribute in the media agenda for the first wave. Similar procedures were used for the other nine waves for this attribute to generate respective values of 207, 177, 144, 159, 252, 280, 235, 265 and 358. These values were used to create the column for the ***Solution*** variable in the "secondary" dataset.

Dependent variables were calculated using means of responses to questions in each wave. For example, in Wave 1,001 people participated in the survey. The index mean of the climate change salience (consisting of three variables, see pages 47-48 for

more details) for the first wave was 2.24. Similar calculations were conducted for the other nine waves to generate the respective index means of 2.38, 2.39, 2.32, 2.31, 2.39, 2.34, 2.31, 2.31 and 2.32. These 10 values were used to represent the public climate change salience in the "secondary" data. This method was adapted from a previous agenda-setting research by Saldana, et al., (2013) where there was no media use variable available.

To examine RQ1, which asks about attribute salience on the media agenda, I used descriptive data for the comparisons.

To test H1, which asserts that conservative media will be more likely to emphasize dismissive attributes than liberal and middle ground media (H1a) and liberal media will be more likely to emphasize accepting attributes than conservative and middle ground media, one-way ANOVA was adopted. Before ANOVA was used, tests of normality and homogeneity of variances were conducted on the 12 attributes. Results showed violations of assumptions for both. In terms of test of normality, the variables were not normally distributed, with skewness ranging from 2.43 to 15.27 and kurtosis ranging from 8.84 to 331.04. Shapiro Wilk's coefficients were all significant with $p < 0.001$. Although scholars posited that analysis of variance is robust to non-normally distributed samples, especially when the sample size is large (in this case: 1,523) and when there is a similar pattern of skewness (in this case all variables were positively skewed) (Hopkins & Weeks, 1990), still, transformation procedures were applied to reduce non-normality of the variables (Osborne, 2010). I used Box and Cox's approach (1964), which required taking the square roots of all values in the variable to be

transformed. For the most part, the transformation was successful with nine variables having skewness and eight having Kurtosis values smaller than 2 (See Table 4). In terms of violations of the assumption of homogeneity of variances, test results showed all Levene's values were statistically significant with $p < 0.001$. I used Welch's coefficient values for the correction of the F-tests (Brown & Forsythe,1974; Tomarken & Serlin, 1986). In addition, Bonferroni's correction tests were also conducted to counteract the problems with multiple comparisons between the independent variable – media type – and dependent variables – media attributes.

Table 4. Skewness and Kurtosis of attributes before and after transformation

Attributes	**Skewness**		**Kurtosis**	
	Original	**Reduced**	**Original**	**Reduced**
Issue Image				
Bad-Effects	3.17	.82	16.29	.19
No-Effects	2.77	1.7	8.84	1.5
Issue Remedy				
Solution	2.65	.52	12.87	.47
No-Solution	4.48	1.27	45.57	.86
Issue Existence				
Existence	2.43	.49	9.25	.54
No-Existence	3.84	1.21	23.59	.72
Issue Linkages				
Energy	3.0	1.4	13.53	.17
No-Energy	4.2	3.5	18.26	10.6
Economy	3.62	.87	25.06	.29
No-Economy	3.66	2.9	13.77	6.9
Society	3.99	1.9	22.98	2.91
No-Society	15.27	8.07	331.04	73.86

Zero-order Pearson's correlations were used to answer and to test all the rest of the RQs and Hs. Although all the correlation tests were bivariate and independent from one another running multiple correlation tests on the same variables may increase the rate of incorrectly rejecting the null hypotheses. In this dissertation I report the results using both the "liberal" and "conservative" approaches in analyzing the data. Specifically, in the "liberal" view, the p values or significance of all correlation tests were kept at the

traditional 0.05 level. In the conservative approach, Bonferroni's approach was used. Significant levels were adjusted using the formula 0.05 (regular significant level) x 1/m (m = number of tests) to maintain the family wise error rate.

For RQ2 (a, b) independent variables were the 18 attribute variables. Dependent variables were the public's issue salience and intention to engage in activism.

To answer RQ3 on the compelling arguments effects of the overall media's climate change attributes on ideological publics, I used the cumulated sums of the 12 attributes from all four publications as the independent variables. Means of climate change issue salience are the dependent variables and were calculated separately for liberal and conservative respondents. I correlated the 18 independent variables with each of the two dependent variables.

To test H2a, which predicts stronger compelling arguments effects of partisan media on partisan publics than those of the salience of attributes in all media the independent variables were the salience of media climate change attributes. The dependent variables were climate change issue salience in ideological and overall public agendas. I first created new variables with media climate change attribute salience by media type. A similar approach was used for the public agenda. Basically, three media agendas (i.e. overall, liberal, and conservative) and two public agendas (i.e. liberal, and conservative) were identified. I conducted a series of correlation tests and compared the results in order to see if there are any differences in these relationships.

To test H2b, which predicts strongest compelling arguments effects from both independent and overall media on independent than on liberal and conservative publics I identified the relationships between media attributes in both the overall and middle ground media agendas and climate change issue salience in the agenda of independent respondents. Results of the correlation tests then were compared against those for liberal and conservative respondents.

To test H3 (a, b), which assumes the effects of belief certainty in the existence of climate change/global warming on the relationships between media attributes and public issue salience and intention to engage in climate change activism I used attribute salience in the media agenda as independent variables. Dependent variables were issue salience and activism engagement divided into two groups of respondents: high and low belief certainty. Test results were then compared to identify differences.

In order to answer RQ4 about source effects on the relationships between media attribute salience, I used media attribute salience stratified by sources as independent variables, and public issue salience and activism intention from the surveys as dependent variables.

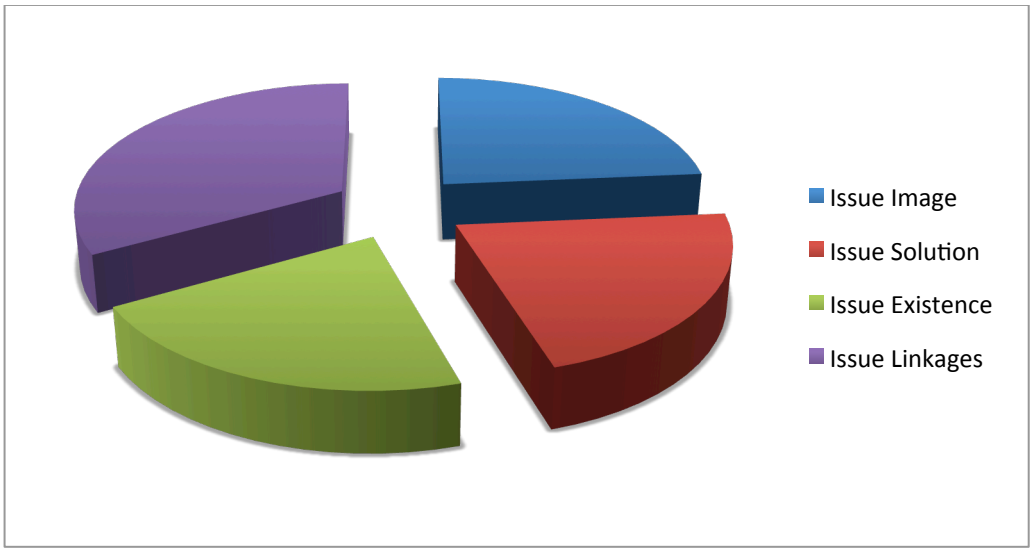
CHAPTER 4: RESULTS

The purpose of this study is to understand the media coverage of climate change and its compelling arguments effects on the public in the five years from 2009 to 2014. In this section, I will present the results of data analyses, divided into five major parts. The first part focuses on the media climate change attribute agenda and how attributes varied across media types. The second is concerned with the compelling arguments effects of climate change attributes on all audiences. The third, however, goes further to investigate these effects on various public groups including liberals, conservatives and independents. The fourth is concerned with the moderating role of climate change belief certainty – an individual predisposition factor. The last examines the influence of sources on compelling arguments effects.

Media Agenda of Climate Change

RQ1 asks which attributes of climate change are salient in the news. Descriptive data show that in the 30 months studied, a total of 16,811 times climate change attributes were mentioned in the four publications examined in detail. As detailed earlier, media climate change attributes were divided into the four larger groups of attributes including Issue Image (i.e. ***Bad-Effects*** and ***No-Effects***); Issue Remedy (i.e. ***Solution*** and ***No-Solution***); Issue Existence (i.e. ***Existence*** and ***No-Existence***, and; Issue Linkages (i.e. ***Energy*** and ***No-Energy; Economy*** and ***No-Economy***, and; ***Society*** and ***No-Society***) (See Figure 2 and Table 4 for details).

Figure 3: Four groups of macro attributes of climate change (N= 16,811)



In terms of a single attribute, ***Bad-Effects*** in the issue image group was the most salient (3,220) in the media agenda. The media preferred to portray climate change in association with such negative consequences of this environmental phenomenon as rising temperatures, glacier melting, or more frequent severe weather among others.

The second most salient attribute of climate change was ***Solution*** (2,512) in the Issue Linkages group. ***Existence*** (2,205) in the Issue Existence group was the third most salient attribute. Of all the single attributes, denying linkages between climate change and multiple issues appeared most infrequently in the media agenda. Specifically, ***No-Society*** was at the bottom of the list, being mentioned only 79 times. Even though some might deny climate change, explicitly rejecting the link between this environmental phenomenon and other issues was not the preferred strategy. Overall, the Issue Linkages group had the highest frequency of being mentioned with a total of 5,576 times attributes in this group were present in the news.

Table 5. Number of attributes by wave of data collection

Attribute	W1 (2009)	W2 (2010)	W3 (2010)	W4 (2011)	W5 (2011)	W6 (2012)	W7 (2012)	W8 (2013)	W9 (2013)	W10 (2014)	Total
Issue Image											
Bad Effects	224 (7%)	301(9.4%	175 (5.4%)	196 (6.1%)	184 (5.7%)	534(16.6%)	435 (13.5%)	368 (11.4%)	401 (12.5%)	402 (12.5%)	**3220 (100%)**
No Effects	163 (21.8%)	32 (4.3%)	69 (9.2%)	83 (11.1%)	58 (7.8%)	54 (7.2%)	59 (7.9%)	94 (12.6%)	78 (10.4%)	58 (7.8%)	**748 (100%)**
Total	**387 (9.6%)**	**333 (8.4%)**	**244 (6.2%)**	**279 (7.0%)**	**242 (6.1%)**	**588 (14.8%)**	**494 (12.5%)**	**462 (11.6%)**	**479 (12.1%)**	**460 (11.6%)**	**3968 (100%)**
Issue Remedy											
Solution	435 (17.3%)	207 (8.2%)	177 (7.1%)	144 (5.7%)	159 (6.3%)	252 (10%)	280 (11.2%)	235 (9.4%)	265 (10.6%)	358 (14.3%)	**2512 (100%)**
No Solution	358 (31.4%)	53 (4.7%)	71 (6.2%)	94 (8.2%)	56 (4.9%)	101 (8.9%)	127 (11.1%)	84 (7.4%)	106 (9.3%)	91 (8.0%)	**1141 (100%)**
Total	**793 (21.7%)**	**260 (7.1%)**	**248 (6.8%)**	**238 (6.5%)**	**215 (5.9%)**	**353 (9.7%)**	**407 (11.1%)**	**319 (8.7%)**	**371 (10.2%)**	**449 (12.3%)**	**3653 (100%)**
Issue Existence											
Existence	360 (16.3%)	137 (6.2%)	76 (3.5%)	184 (8.4%)	94 (4.3%)	242 (11%)	252 (11.4%)	220 (10%)	332 (15.1%)	308 (14%)	**2205 (100%)**
No-Existence	391 (27.8%)	97 (6.9%)	43 (3.1%)	174 (12.3%)	80 (5.7%)	104 (7.4%)	140 (9.9%)	118 (8.4%)	164 (11.6%)	98 (7.0%)	**1409 (100%)**
Total	**751 (20.8%)**	**234 (6.5%)**	**119 (3.3%)**	**358 (9.9%)**	**174 (4.8%)**	**346 (9.6%)**	**392 (10.8%)**	**338 (9.4%)**	**496 (13.7%)**	**406 (11.2%)**	**3614 (100%)**
Issue Linkage											
Energy	252 (11.7%)	174 (8.1%)	160 (7.4%)	65 (3.0%)	102 (4.8%)	148 (6.9%)	298 (13.9%)	193 (9.0%)	341 (15.9%)	415 (19.3%)	**2148 (100%)**
No-Energy	34 (14.1%)	16 (6.6%)	14 (5.8%)	11 (4.6%)	9 (3.7%)	12 (5%)	43 (17.8%)	16 (6.6%)	45 (18.7%)	41 (17%)	**241 (100%)**
Economy	454 (23.8%)	118 (6.2%)	95 (5%)	76 (4.0%)	113 (5.9%)	132 (6.9%)	229 (12%)	198 (10.4%)	212 (11.1%)	284 (14.9%)	**1911 (100%)**
No-Economy	57 (21%)	13 (4.8%)	4 (14.8%)	14 (5.1%)	12 (4.4%)	18 (6.6%)	48 (17.7%)	29 (10.7%)	42 (15.5%)	35 (12.9%)	**272 (100%)**
Society	131 (14.2%)	62 (6.7%)	55 (5.9%)	45 (4.9%)	42 (4.5%)	49 (5.3%)	101 (10.9%)	108 (11.7%)	122 (13.2%)	210 (21.7%)	**925 (100%)**
No-Society	12 (15.1%)	2 (3.5%)	9 (11.4%)	15 (19%)	15 (19%)	0 (0%)	2 (2.5%)	2 (2.5%)	12 (15.2%)	10 (12.7%)	**79 (100%)**
Total	**940 (16.9%)**	**385 (6.9%)**	**337 (6%)**	**226 (4.1%)**	**293 (5.3%)**	**359 (6.4%)**	**721 (12.9%)**	**546 (9.8%)**	**774 (13.9%)**	**995 (17.8%)**	**5576 (100%)**

Table 6. Means of salience of climate change in the public's agenda and behavioral intention

Variable	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
Salience	2.24	2.38	2.29	2.32	2.31	2.39	2.34	2.31	2.31	2.32
Behavior	1.89	1.94	1.91	1.92	1.93	1.95	1.95	1.92	1.94	N/A

H1a predicts that conservative media will be more likely to emphasize dismissive attributes (i.e. ***No-Effects, No-Solution, No-Existence,*** etc.). One-way ANOVAs revealed statistically significance Welch's results with F values ranging from F (2, 630.1) = 7.5 p = 0.001 for ***No-Society*** to F (2, 608.53) = 61.1 p = 0.001 for ***No-Econmy*** (See Table 7). This means that there are differences in the means of attributes used in articles from different media types. A closer look at Bonferroni's correction test results showed the means of dismissive attributes per article in the conservative media were significantly higher than those in the liberal and middle ground media. H1a was strongly supported (See Table 7).

Table 7. One-way ANOVA results for dismissive attributes by media type

Attributes	Welch's F value	Liberal Media			Middle ground			Conservative	
		M	SD	MD	M	SD	MD	M	SD
No-Effects	F (2, 517.32) = 42***	.24	.56	-.44***	.21	.49	-.47***	.69	.79
No-Solution	F (2, 545.11) = 18.7***	.47	.71	-.18**	.28	.58	-.36***	.64	.85
No-Existence	F (2, 630) = 53***	.48	.72	-.53***	.32	.60	-.69***	1.01	.95
No-Energy	F (2, 612.07) = 16.8***	.10	.38	-.09**	.03	.21	-.16***	.20	.47
No-Economy	F (2, 650.83) = 61.1***	.15	.45	-.11**	.01	.12	-.25***	.26	.55
No-Society	F (2, 630.12) = 7.5**	.03	.21	-.05**	.01	.09	-.07**	.08	.33

Notes: M = Mean of attribute mentions/ article; SD = Standard Deviation; MD = Mean differences against the means of attribute mentions on the conservative media agenda with Bonferroni's correction results; $^{**}p < 0.01$; $^{***}p < 0.001$

H1b hypothesizes that liberal media will be more likely to emphasize accepting attributes (i.e. ***Bad-Effects, Solution, Existence, Energy,*** etc.). Results from ANOVA Welch tests indicated statistically significant differences for all accepting attributes between the three media agendas in Welch's F values which ranged from F (2, 592.45) = 36.54 $p < 0.001$ for ***Economy*** to F (2, 608.53) = 114.09 $p < 0.001$ for ***Solution*** (See Table 8). According to the Bonferroni's correction results, the means of accepting attribute mentions on the liberal media agenda were significantly higher than those on the conservative media agenda. The means of three accepting attributes including ***Solution, Energy*** and ***Economy*** on the liberal media agenda were significantly higher than those in the middle ground media agenda. The means of two attributes (e.g. ***Existence*** and

Society) in the middle ground media were significantly higher than those in the liberal media. ***Bad-Effects***, however, did not see any statistically significant difference between the means of this attribute in the two media agendas. This indicates that liberal media are more likely to highlight climate change accepting attributes than conservative media. They are also more likely to emphasize solutions to climate change and the links between this environmental phenomenon and the issues of ***Energy*** and ***Economy*** than middle ground media. H1b is partially supported.

Table 8. One-way ANOVA results for accepting attributes by media type

Attributes	Welch's F value	Conservative			Middle ground			Liberal	
		M	SD	MD	M	SD	MD	M	SD
Bad-Effects	F (2, 612.19) = 111.65***	.41	.99	-.73***	1.1	1.1	-.03	1.14	1.11
Solution	F (2, 608.53) = 114.09***	.42	.64	-.32***	.75	.73	-.39***	1.14	.90
Existence	F (2, 629) = 107.72***	.45	.61	-.78***	1.2	.66	+.35***	.88	.89
Energy	F (2, 654.29) = 58.18***	.42	.67	-.46***	.40	.69	-.49***	.89	1.03
Economy	F (2, 656.37) = 36.54***	.60	.80	-.44***	.63	.81	-.41***	1.04	1.05
Society	F (2, 630.12) = 42.01***	.13	.38	-.31***	.29	.61	+.17**	.44	.77

Notes: M = Mean of attribute mentions/ article; SD = Standard Deviation; MD = Mean differences against the means of attribute mentions on the liberal media agenda with Bonferroni's correction results; $^{**}p < 0.01$; $^{***}p < 0.001$

Compelling arguments effects on all audiences

To examine the relationship between the media coverage and the public agenda regarding this controversial issue, RQ2a inquired about the compelling arguments effects of specific media attributes on the salience of climate change on the public's agenda. Pearson's correlation test results showed three attributes on the media agenda were negatively correlated with the public's perceived importance of climate change. They were ***No-Effects*** (r = -0.83, p<0.01), ***No-Solution*** (r = -0.63, p<0.05 and ***No-Society*** (r = -0.64, p<0.05) (See Table 9). This shows that the more the media say climate change doesn't have any effects, there is no solution that would work, or discredit the link between climate change and social issues; the more likely the public would think climate change is an important issue. After Bonferroni's correction measures were applied, the significance level was raised to 0.0042 (0.05/12). The only relationship between No-Effects and the public's perceived importance of climate change remained significant (r = -0.83, p = 0.003).

In short, examining the effects of overall media climate change attributes on the public without taking into account their ideologies would lead to a conclusion that only dismissive attributes would decrease the public's perceived importance of climate change.

RQ2b was concerned with the extent to which media climate change attributes motivate the public to engage in activism. According to results of the Pearson's correlations analyses, only ***Bad-Effects*** (r = +0.71, p<0.05) was positively associated with the public intention to engage in activism. This shows that the frequency of

mentions of negative consequences events could motivate the public in taking actions to fight climate change. Another attribute that had negatively significant effects on the public's intention to get involved in climate change activism was ***No-Effects*** (r = -0.81, p<0.01).

When correction measures were applied, which means the p values or significance levels for all 18 correlations on each variable would be adjusted to 0.0042 (0.05/12=0.0042), none remained significant.

Compelling arguments effects on different audience groups

RQ3 asked about the differences in compelling arguments effects of the overall media agenda on partisan publics. Results of Pearson's correlation tests showed that only ***Bad-Effects*** exerted strong positive influence on the salience of climate change on the agenda of liberal publics (r = +0.96, p<0.001). This means that the more the media mention negative consequences of climate change, the more important liberal audiences think the issue is. After Bonferroni's corrections were used (p = 0.0042) the relationship between this attribute and public salience remained statistically significant.

Seven attributes in the overall media agenda had negatively significant associations with the conservative public's perceived importance of climate change. Those included ***No-Effects*** (r = -0.77, p<0.01); ***Solution*** (r = -0.74, p<0.05); ***No-Solution*** (r = -0.66, p<0.05); ***Existence*** (r = -0.67, p<0.05); ***Economy*** (r = -0.83, p<0.01); ***No-Economy*** (r = -0.73, p<0.05); and ***Society*** (r = -0.76, p<0.05). Of those attributes three were dismissive and three were accepting. This shows that when the

media mention negative consequences of climate change, solutions to the phenomenon, the evidence of its existence, the link or lack of link it has with economic and social issues, conservative audiences' perceived importance of it would decrease. Again, Bonferroni's corrections were used. Test results indicated that only ***Economy*** was significant at the corrected alpha of 0.0042.

There were no statistically significant effects of media climate change attributes on independents.

In sum, the results indicate that for liberal publics the more frequently the media discuss bad effects of climate change liberals are more likely to perceive it as an important issue. In contrast, the more frequently the media report on climate change attributes, the salience of the issue decreases among conservative publics.

Table 9. Compelling arguments effects from different media on the salience of climate change among different public groups.

Attribute	Liberal Media & Liberal Public	Conservative Media & Conservative Public	Independent Media & Independent Public	Overall Media Agenda			
				& Liberal Public	& Conservative Public	& Independent Public	& All public groups
Issue Image							
Bad-Effects	**+0.96*** **	**-0.72***	-0.31	**+0.96*** **	+0.07	+0.31	+0.59
No-Effects	-0.21	-0.62	-0.23	-0.35	**-0.77****	-0.30	**-0.83****
Issue Remedy							
Solution	**+0.65***	**-0.72***	-0.07	+0.30	**-0.74***	-0.09	-0.39
No-Solution	-0.09	-0.56	+0.05	-0.20	**-0.66***	-0.08	-0.63
Issue Existence							
Existence	**+0.64***	-0.53	-0.10	+0.46	**-0.67***	+0.03	-0.25
No-Existence	+0.27	-0.58	+0.34	-0.24	-0.59	+0.01	-0.59
Issue Linkages							
Energy	+0.63	**-0.75***	-0.58	+0.55	-0.61	-0.06	-0.16
No-Energy	+0.26	+0.02	+0.28	+0.43	-0.59	+0.01	-0.25
Economy	+0.62	**-0.65***	-0.23	+0.35	**-0.83****	-0.28	-0.48
No-Economy	+0.18	+0.08	+0.34	+0.42	**-0.73***	-0.13	-0.39
Society	+0.40	-0.30	-0.21	+0.41	**-0.76***	-0.32	-0.32
No-Society	-0.33	-0.07	+0.34	-0.61	-0.33	-0.43	**-0.64***

*Notes: *p < 0.05; **p < 0.01; ***p < 0.001*

H2a predicted stronger compelling arguments effects of partisan media on partisan publics than those of all media. Pearson's correlation test results partially supported this hypothesis. Specifically, three climate change attributes on the liberal media agenda had statistically significant relationships with liberal respondents' perceived importance compared to one attribute from all media. All three were positive. These three attributes were ***Bad-Effects*** (r = +0.96, p<0.001), ***Solution*** (r = +0.65, p<0.05) and ***Existence*** (r = +0.64, p<0.05). In short, the number of attributes on the liberal media agenda that had significant relationships with liberal publics' perceived importance of climate change is larger than that of all media publications. This supports H2a. After Bonferroni's corrections, which raised the significance level to 0.0042, only ***Bad-Effects*** had statistically and positively significant association with the liberal public's assessment of the importance of this environmental phenomenon (p = 0.000017).

For conservative media, test results showed that only ***Energy*** was significantly associated with the conservative public's perceived importance of climate change (r = -0.68, p<0.05). This is a much weaker influence, compared with seven statistically significant links between attributes from the overall media agenda and conservative's assessment of the importance of climate change. The hypothesis is not supported among conservatives. While both the attribute agendas of conservative and all media had negative effects, more of the attributes on the all media agenda had negative effects. Overall, H2a is only partly supported.

H2b hypothesized that compelling arguments effects from both overall and middle ground media will be strongest among independents or moderates. This

hypothesis is not supported. In fact, media attributes from the overall as well as middle ground media agenda had no significant relationships with independents' perceived importance of climate change. This means the independents are not likely to be swayed by the media agenda vis-à-vis climate change.

Certainty of belief in climate change

H3a predicted that certainty of belief in the existence of climate change will influence the relationship between media attribute agendas and public issue salience. Statistical test results showed that two attributes, ***Bad-Effects*** (r = +0.87, p<0.001and ***No-Society*** (r = -0.80, p<0.01) had strong compelling arguments effects among the respondents who are more certain that climate change is happening (See Table 10). In contrast, no statistically significant effects of media climate change attributes were observed among members of the lower certainty group. This indicates the media attribute agenda on climate change influences a segment of the public who are certain about the existence of the issue. After Bonferroni's correction measures were adopted, only Bad-Effects still had a significant relationship with the perceived importance of climate change among those with high belief certainty. This means, belief certainty does influence the relationship between this media attribute and the public's assessment of the importance of climate change.

H3b predicts significant effects of belief certainty on the relationships between media attributes and the public's intention to engage in activism. Statistical analyses showed that among those with higher certainty in the existence of climate change, mentioning ***Bad-Effects*** (r = +0.84, p<0.01) motivated them to take actions to battle climate change. This means the portrayal of climate change in terms of negative or

disastrous consequences in the media have strong effects on people who believe in the existence of the phenomenon. After Bonferroni's corrections, ***Bad-Effects*** did not see a statistically significant relationship with the intention of engaging in activism among the public of both groups.

Table 10. Compelling arguments effects on low and high certainty groups

Attributes	Low Certainty		High Certainty	
	A	B	A	B
Issue Image				
Bad-Effects	+0.12	-0.33	**+0.87*****	**+0.84****
No-Effects	-0.33	-0.56	-0.42	-0.47
Issue Remedy				
Solution	+0.07	-0.49	+0.12	-0.20
No-Solution	-0.16	-0.42	-0.18	-0.46
Issue Existence				
Existence	-0.01	-0.59	+0.26	+0.19
No-Existence	-0.14	-0.48	-0.17	-0.43
Issue Linkages				
Energy	+0.29	-0.14	+0.16	+0.24
No-Energy	+0.19	-0.04	+0.08	+0.19
Economy	-0.08	-0.59	+0.03	-0.10
No-Economy	-0.04	-0.40	+0.09	-0.02
Society	+0.11	-0.51	0.00	-0.01
No-Society	-0.29	+0.26	**-0.80****	-0.48

Note: A = Issue salience; B = Intention to engage in activism

Source Effect Analysis

RQ4 asked about the influence of source use in the news on the compelling arguments effects of media attributes on public perceived importance of climate change and action. Test results indicated that of all the sources, reporters had the strongest influence on the relationships between the media attribute agenda and the public's importance assessment of climate change. When mentioned by reporters four attributes were significantly associated with public climate change salience. Of those attributes mentioned by reporters ***Bad-Effects*** was the only that was positively correlated with public issue salience of climate change (r = +0.66, p<0.05). This means the more reporters/TV show hosts mention climate change's negative consequences the public would be the more likely that the public would rate the issue important. Three negatively significant correlations between reporter-mentioned attributes and public opinion and intention regarding climate change were between ***No-Effects*** (r = -0.65, p<0.05), ***No-Solution*** (r = -0.66, p<0.05) and ***Economy*** (r = -0.65, p<0.05). This indicates that the more frequently journalists mention there is no effects associated with climate change; no solution to this problem, and its link with economic issues the more likely the public would attribute the responsibilities to individuals. (See Table 11 for more details).

Journalist-mentioned attributes had no effects on the public's intention to engage in activism with respect to climate change.

Politicians were the second most influential sources regarding public climate change salience. Of the attributes mentioned by this type of source, two had statistically significant agenda-setting effects on public opinion including ***No-Solution*** (r = -0.66,

$p<0.05$) and ***Existence*** ($r = -0.65$, $p<0.05$). This indicates that when politicians mentioned there is no solution to climate change or that climate change is happening, the public's assessment of the importance of climate change decreases.

Two politician-mentioned attributes had statistically and negatively significant effects on the public's intention to engage in activism including No-Solution ($r = -0.73$, $p<0.05$) and No-Society ($r = -0.82$, $p<0.01$). This means when politicians' mentioning of these two dismissive attributes discourages the public from engaging in climate change activism.

Scientists also had some influence on public opinion and behavior toward climate change. The frequency of mentions of ***Bad-Effects*** ($r = +0.70$, $p<0.05$) by scientists had statistically and positively significant effects on the public's behavioral intention with regards to climate change.

To maintain the family-wise error rate of the correlation, again significance level adjustments ($p = 0.05/84 = 0.0006$) were adopted. Results showed no association stayed significant.

Table 11. Correlation coefficients of relationships between attributes mentioned by sources in the media and public assessment of issue importance and intention to engage in activism

Attributes	Salience							Activism						
	S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**
Issue Image														
Bad-Effects	+0.60	-0.07	+0.48	+0.12	+0.46	**+0.66***	-0.08	**+0.70***	+0.23	+0.51	+0.41	+0.28	+0.59	+0.12
Good-Effects	-0.42	-0.59	-0.01	-0.32	-0.65	**-0.65***	-0.28	-0.50	-0.52	-0.07	-0.16	-0.51	-0.65	-0.30
Issue Remedy														
Solution	+0.29	-0.61	+0.01	+0.03	-0.57	-0.02	-0.09	+0.27	-0.58	-0.24	+0.34	-0.17	+0.32	-0.15
No-Solution	-0.51	**-0.66***	-0.07	-0.02	+0.25	**-0.66***	+0.08	-0.39	**-0.73***	-0.10	+0.38	+0.41	-0.61	+0.48
Issue Existence														
Existence	+0.08	**-0.65***	-0.17	+0.02	-0.33	+0.15	+0.11	+0.33	-0.53	+0.12	+0.26	-0.43	-0.25	+0.08
No-Existence	-0.37	-0.37	+0.23	+0.02	+0.19	-0.63	-0.14	-0.48	-0.33	+0.44	+0.29	+0.43	-0.67	+0.18
Issue Linkage														
Energy	+0.20	-0.55	-0.02	-0.07	-0.14	-0.05	-0.01	+0.61	-0.42	-0.22	+0.16	-0.49	+0.33	N/A
No-Energy	-0.42	-0.29	+0.00	-0.09	+0.30	-0.22	-0.01	-0.61	-0.13	+0.07	+0.23	+0.58	+0.23	N/A
Economy	+0.08	-0.57	+0.32	-0.10	-0.05	**-0.65***	-0.07	+0.26	-0.34	+0.34	+0.09	-0.29	-0.50	-0.15
No-Economy	-0.25	-0.53	+0.04	-0.04	+0.16	-0.38	-0.01	-0.46	-0.35	+0.34	+0.42	-0.17	+0.00	N/A
Society	-0.02	-0.40	+0.09	-0.03	-0.56	-0.40	+0.17	+0.27	-0.62	+0.09	+0.02	-0.60	-0.30	+0.02
No-Society	-0.14	-0.65	N/A	-0.11	+0.11	-0.34	N/A	-0.01	**-0.82****	N/A	+0.10	-0.09	-0.16	N/A

Note: S1 = Scientist; S2 = Politician; S3 = Business people; S4 = Activist; S5 = Regular people; S6 = Reporter/Journalist; S7 = Other
** $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

CHAPTER 5 – DISCUSSION & CONCLUSIONS

In the first part of this chapter, I discuss the findings of the study, reviewing them in the larger context of scholarly research in this specific area as well as juxtaposing them against climate change social realities. In the second part, conclusions will be drawn based on the research findings and implications. Also, I will address the limitations of this study and provide suggestions for future research.

Discussion

This study is one of a very few studies that examine the salience of climate change attributes in the media longitudinally (Liu et al., 2011), and perhaps is the first that has done so in U.S. national media. Among all 12 single attributes found in the media coverage, ***Bad-Effects*** was most salient. This is in line with results of past research (Hart & Feldman, 2014), which reported that the news media primarily presented climate change as a threat. There are several explanations for this. First, relating the threatening effects of climate change to our everyday life helps make this scientifically complex and psychologically distant issue more understandable and relatable to the public (Binder, Cacciatore, Scheufele, & Brossard, 2014). Second, as a common professional norm, journalists tend to emphasize dramatic and negative aspects of events and issues to elevate their importance in order to draw audience interests (Boykoff, 2007).

The second most salient climate change attribute in the media agenda was the ***Solution***. Perhaps, this is an important aspect of the discourse of climate change in the news where proposals are made for policy changes (Liu et al., 2011). At the same time,

solutions to climate change mitigation and adaptation also include encouraging social acts by individuals (Adger, 2010; Adger, Dessai, Goulden, Hulme, Lorenzoni, Nelson, Naess, Wolf, & Wreford, 2009). These social trends have been well reflected in the media content regarding climate change (Liu et al., 2011; Nisbet, 2009).

Existence was the third most frequently mentioned attribute. This finding corresponds with previous research on climate change (Carvalho, 2007; Mendelsohn & Neumann, 2004; Nisbet, 2009; Smith, 2005), which found a strong link between climate change and public discussions of whether or not the phenomenon exists. This also indicates that despite the fact that evidence of climate change existence has accumulated over the past decades, skepticism of this environmental issue still persists.

The salience of climate change in the media, perhaps, was driven by many events. For example, ***No-Effects*** was salient in the media agenda in the first wave because the climategate, which occurred in late 2009, raised doubts especially among skeptics about the reality of climate change. Similarly 2012 saw a spike in the number of ***Bad-Effects*** mentioned in the media possibly because of such events as the record-high global temperature, the devastation of Hurricane Sandy and several others.

There are differences in the salience of attributes among partisan media. As found in this study, *Fox News* consistently adopted climate change dismissive attributes (e.g. ***No-Effects, No-Solution, No-Existence, No-Society***). In contrast, accepting attributes (e.g. ***Bad-Effects, Solution, Existence***) are more salient in the content from other news publications (e.g. *MSNBC, The New York Times* and *USA Today*). This finding confirms the hypothesis that ideologies play an important role in how climate change is portrayed

in the media. It also is important to note that the salience of climate change attributes in the media was greatly influenced by events that are associated with this issue. For example, in 2009, the climategate incidence and the Climate Change Conference in Copenhagen were the two major drivers of the news coverage of the issue. Accordingly, four dismissive attributes (i.e. ***No-Effects, No-Existence*** and ***No-Solution***) were mentioned frequently in the media. Similarly, droughts across the country, heat waves and the costly and destructive Hurricane Sandy were possible reasons for the emphasis of the news media coverage on the bad effects of climate change and its link with disasters.

The divergence in the media agenda with regards to climate change has some theoretical implications. It is, perhaps, evident that the homogeneity of the media agenda may not hold any more. From an agenda-setting perspective, the media do not transmit a single agenda of climate change. This argument may be applicable only to the attribute agenda and regarding an issue that sees the divide along ideological and political partisanship. In revisiting the agenda-setting concept, this finding, in line with others (Stroud, 2011), confirms the argument that in today's media environment, when examining agenda-setting effects on such a controversial issue as climate change, it is necessary to take into account the stance of particular media outlets.

This study also went a further step to identify whether the media fragmentation and the polarization among the public in terms of climate change have any moderating influences on agenda-setting effects through the lens of the compelling arguments concept. It found that the differences in the media climate change attribute agenda that are found along ideological lines have different effects on respective ideological public

groups. Liberals are more likely to be positively influenced by the mentioning of the negative consequences of climate change. Conservatives, however, are more susceptible to climate change-accepting attributes mentioned in the conservative media, but in the negative direction. This seems like a discrepancy because it was expected that conservatives' perception of climate change should be congruent with how the issue is portrayed in conservative media. However, past research also pointed out that generally conservative audiences are more likely to distrust media and to hold liberal media bias perception than their liberal fellows (Lee, 2005). Possibly because of this, effects of the media on this group of public with regards to an issue they hold strong opinion about actually have a reverse direction.

In general, findings of this research show stronger agenda-setting effects on partisan publics than on independents, which is different from the original agenda-setting research. However, from the selective exposure perspective, the notion that, differences in media agenda lead to differences in public agenda, and that partisan media can set the agenda for their respective audiences (Stroud, 2011).

One of the goals of this study is to identify compelling arguments effects on the public's intention to engage in actions with regards to climate change. It found that two issue image variables ***Bad-Effects*** and ***No-Effects*** exerted influence on the public's behavioral intention. According to the literature in climate change communication fear-inducing messages do not motivate personal engagement in or even act to trigger barriers to fighting against this environmental problem (O'Neill & Nicholson-Cole, 2009). However, findings of this study show the opposite: In general, the representations of

negative consequences of climate change increase audiences' behavioral intention to act against this environmental phenomenon. This study also finds that stating that climate change has no effects discourages people's intention to engage with the issue. These findings demonstrate that, perhaps, issue image attributes should be employed to encourage the public to participate in actions against climate change.

This study found moderating effects of belief certainty in the existence of climate change on the relationship between the media attribute agenda and the public's perceived importance of climate change as well as its behavioral intention. Those with higher belief certainty are more likely to be influenced by the ***Bad-Effects*** attributes to perceive climate change as an important issue as well as to engage in climate change activism than those who do not believe climate change is real. No compelling argument effects were found on those who have lower belief certainty in the existence of this environmental phenomenon. These findings are in line with past research (Corbett & Dufree, 2004; Fortner, Lee, Corney, Romanello, Bonnell, Luthy, Figuerido, & Ntsiko, 2000; Lorenzoni, Nicholson-Cole & Whitmarsh, 2007). Theoretically, this indicates that individual predispositions do influence attribute agenda-setting effects.

Reporters as the source had the strongest influence in terms of number of significant associations, followed by politicians and scientists. However, a closer look reveals that a number of attributes mentioned by reporters and scientists have statistically significant positive associations with public opinion and behaviors regarding climate change. Those that were mentioned by politicians saw only negative relationships. Not all news sources exert equal effects on compelling arguments relationships, confirming the

influence of certain news sources on the agenda-setting relationships between the media and the public (Son & Weaver, 2006). Possible explanations include the general belief that reporters and scientists are more objective than politicians whose words are believed to serve the purpose of their own political agenda.

Methodologically, if a more rigid and conservative approach in data analysis was used, only very few (4) associations between two climate change attributes in the liberal and all media agendas and liberal publics would remain statistically significant. These attributes were ***Bad-Effects***. This implies that liberal publics are more likely to be influenced by respective or overall media agendas than other public groups. Positive agenda-setting effects of the ***Bad-Effects*** attribute were also found among those who are more certain about the existence of climate change, while negative impacts were detected among those who are less certain about the phenomenon. In short, media's emphasis on negative consequences of climate change still shows a strong influence on particular public groups.

Admittedly, out of 12 attributes only ***Bad-Effects*** showed consistent and strong effects on public perception and behavioral intention. There were several possible explanations. First, despite the fact that it is an unobtrusive issue the public would usually has to rely on the media to learn about (McCombs, 2014). However, coverage of climate change in the news media has still been limited. This has also caused public apathy towards this issue. Second, the use of Pearson's correlation tests did not allow for more powerful statistical analyses, which might reveal more accurate results about the relationships between the independent and dependent variables.

Conclusion, Limitations, and Future Research

This study investigates the compelling argument effects of media climate change attributes on public opinion and intention to participate in activism. It contributes to the literature of agenda setting through exploring the intersection of the compelling argument effects and political polarization premises. Specifically, it takes into account individual ideological differences among partisan public groups, and demonstrating the moderating effects of these differences on agenda-setting effects.

Studying agenda-setting effects is not new. But examining these effects concerning an unobtrusive issue like climate change is not at all common. An extensive search of the literature indicated very few studies have applied the theory to climate change (Brulle et al., 2012; Zhao et al., 2014). None has investigated the compelling arguments concept so far. This study is likely the first that has delved into this area. The implementation of this project therefore provides a testimony to the application of this widely used theoretical framework in today media environment and on such a highly controversial issue as climate change.

Findings of this study confirm some compelling arguments effects between the media and the public. It addresses an important question that has been raised for some time: In today's ideologically fragmented media, is the media content on a highly controversial issue like climate change still homogeneous? Findings demonstrate that the homogeneity of the media attribute agenda particularly with regards to climate change is no longer present. Instead, how climate change is portrayed depends on the media organization's ideology. That ideological fragmentation has consequential implications.

Evidence from this research shows compelling arguments effects are different for different ideological public groups. In addition, this study also found that public predispositions such as belief in climate change could influence the compelling arguments effects of the media on the public.

This study contributes to agenda-setting research through suggesting a unique approach in exploring compelling argument effects. That is, it extends the compelling arguments concept by assessing the influence of media attribute salience on public issue salience and actions. Previous research has often been limited to investigating only attitudinal and cognitive consequences of compelling argument effects. This study, however, has shed a new light on the application of this concept through providing empirical evidence of compelling argument effects, confirming that the salience of attribute agenda setting does not only influence public salience of an issue object but also behavioral intention towards that issue.

This study is not without limitations. First, in terms of survey data, the use of secondary data led to several problems during the implementation of this research project. For example, the absence of a media use variable made it impossible to properly measure respondents' media exposure. Without that variable, I was not able to utilize more powerful and sophisticated statistical analyses, which looks at predictive rather than correlational relationships. In addition, such an absence did not allow for using individual articles (independent variables) and individual respondents as units of analysis. Furthermore, having no media use variable also affected the way this research applied the selective exposure theory. I was not able to identify whether the respondents used the

type of media that are in line with their ideologies, thus providing more accurate evidence of the intersection between agenda setting and selective exposure. The use of cross-sectional data in this study might have weakened its statistical analyses.

Second, this study could have included more news sources such as online news sites for media content data. Third, I could have examined affective attributes in combination with substantive attributes, especially when coding for media content on a highly contentious issue like climate change. The inclusion of affective attributes would permit a more thorough examination of how the news media portray the climate change controversy.

Weaknesses of this study, however, suggest possible directions for future research in this area. Proper measurement of the public's media use will help single out which type of media that the public has been exposed to, hence allow for more accurate identification of effects from the content of that type of media. In addition, using panel data may provide more accurate results of longitudinal media effects. Future studies should also examine substantive attributes in combination with affective attributes to see how such a combination influences public perception of, opinion about, and behaviors toward climate change.

REFERENCES

Abramowitz, A. I., & Saunders, K. L. (2008). Is polarization a myth? *The Journal of Politics, 70*(02), 542-555.

Adger, W. N. (2010). Social capital, collective action, and adaptation to climate change *Der klimawandel* (pp. 327-345): Springer.

Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., Naess, L. O., Wolf, J., & Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change, 93*(3-4), 335-354.

Anderson, A. (2009). Media, politics and climate change: towards a new research agenda. *Sociology Compass, 3*(2), 166-182.

Antilla, L. (2005). Climate of scepticism: US newspaper coverage of the science of climate change. *Global Environmental Change, 15*(4), 338-352.

Arlt, D., Hoppe, I., & Wolling, J. (2011). Climate change and media usage: Effects on problem awareness and behavioural intentions. *International Communication Gazette, 73*(1-2), 45-63.

Atwood, E. L., Sohn, A. B., & Sohn, H. (1978). Daily newspapers contributions to communication discussion. *Communication Quarterly, 55,* 570-76.

Baldassarri, D., & Gelman, A. (2008). Partisans without constraint: Political polarization and trends in American public opinion. *American Journal of Sociology, 114*(2), 408.

Becker, A. B., Dalrymple, K. E., Brossard, D., Scheufele, D. A., & Gunther, A. C. (2010). Getting citizens involved: How controversial policy debates stimulate issue participation during a political campaign. *International Journal of Public Opinion Research, 22*(2), 181-203.

Bennett, L. W. (1996). *News: The politics of illusion*. New York, NY: Longman.

Bennett, W. L., & Iyengar, S. (2008). A new era of minimal effects? The changing foundations of political communication. *Journal of Communication, 58*(4), 707-731.

Binder, A., Cacciatore, M., Scheufele, D., & Brossard, D. (2014). The role of news media in the social amplification of risk. In *The SAGE handbook of risk communication.* (pp. 69-86). Thousand Oaks, CA: SAGE Publications.

Boykoff, M. T. (2007). From convergence to contention: United States mass media representations of anthropogenic climate change science. *Transactions of the Institute of British Geographers, 32*(4), 477-489.

Boykoff, M. T. (2008). Lost in translation? United States television news coverage of anthropogenic climate change, 1995–2004. *Climatic Change, 86*(1-2), 1-11.

Boykoff, M. T. (2013). Public enemy no. 1? Understanding media representations of outlier views on climate change. *American Behavioral Scientist, 57*(6), 796-817.

Boykoff, M. T., & Boykoff, J. M. (2004). Balance as bias: global warming and the US prestige press. *Global environmental change, 14*(2), 125-136.

Boykoff, M. T., & Boykoff, M. J. (2007). Climate change and journalistic norms: A case-study of US mass-media coverage. *Geoforum, 38*(6), 1190-1204.

Boykoff, M. T., & Roberts, J. T. (2007). Media coverage of climate change: Current trends, strengths, weaknesses. *Human Development Report, 2008*, 3.

Boyle, M. P., & Schmierbach, M. (2009). Media use and protest: The role of mainstream and alternative media use in predicting traditional and protest participation. *Communication Quarterly, 57*(1), 1-17.

Box, G. E. P., & Cox, D. R. (1964). An analysis of transformations. *Journal of the Royal Statistical Society, 26*(211-234).

Brown, M. B., & Forsythe, A. B. (1974). The small sample behavior of some statistics which test the equality of several means. *Technometrics*, *16*(1), 129-132.

Brulle, R. J., Carmichael, J., & Jenkins, J. C. (2012). Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the US, 2002–2010. *Climatic Change, 114*(2), 169-188.

Burstein, P. (2003). The impact of public opinion on public policy: A review and an agenda. *Political Research Quarterly, 56*(1), 29-40.

Carvalho, A. (2007). Ideological cultures and media discourses on scientific knowledge: re-reading news on climate change. *Public Understanding of Science, 16*(2), 223-243.

Carvalho, A., & Burgess, J. (2005). Cultural circuits of climate change in UK broadsheet newspapers, 1985–2003. *Risk Analysis, 25*(6), 1457-1469.

Chan, M., & Lee, F. L. (2014). Selective exposure and agenda setting: exploring the impact of partisan media exposure on agenda diversity and political participation. *Asian Journal of Communication, 24*(4), 301-314.

Comstock, G., & Scharrer, E. (1999). *Television: What's on, who's watching, and what it means*. San Diego, CA: Academic Press.

Corbett, J. B., & Durfee, J. L. (2004). Testing public (un) certainty of science media representations of global warming. *Science Communication*, *26*(2), 129-151.

Corner, A., Whitmarsh, L., & Xenias, D. (2012). Uncertainty, scepticism and attitudes towards climate change: biased assimilation and attitude polarisation. *Climatic Change, 114*(3-4), 463-478.

Craft, S., & Wanta, W. (2004). US public concerns in the aftermath of 9–11: A test of second level agenda-setting. *International Journal of Public Opinion Research, 16*(4), 456-463.

Dirikx, A., & Gelders, D. (2010). To frame is to explain: A deductive frame-analysis of Dutch and French climate change coverage during the annual UN Conferences of the Parties. *Public Understanding of Science, 19*(6), 732-742.

DiSogra, C. (2009). A web panel response rate: It's more than what you think. Retrieved September 10, 2015 from http://www.knowledgenetworks.com/accuracy/fall-winter2009/disogra-fall09.html

Doherty, C. (2014). Seven things to know about polarization in America. Retrieved July 23, 2015 from http://www.pewresearch.org/fact-tank/2014/06/12/7-things-to-know-about-polarization-in-america/

Egan, P. J., & Mullin, M. (2012). Turning personal experience into political attitudes: the effect of local weather on Americans' perceptions about global warming. *The Journal of Politics, 74*(03), 796-809.

Elsasser, S. W., & Dunlap, R. E. (2012). Leading voices in the denier choir: Conservative columnists' dismissal of global warming and denigration of climate science. *American behavioral scientist*, *57*(6), 754-776.

Entman, R. M. (1993). Framing: Towards clarification of a fractured paradigm. *Journal of Communication 43*(4): *51–58*.

Feldman, L., Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. A. (2012). Climate on cable: The nature and impact of global warming coverage on Fox News, CNN, and MSNBC. *The International Journal of Press/Politics, 17*(1), 3-31.

Fiorina, M. P., Abrams, S. J., & Pope, J. C. (2005). *Culture war? The myth of polarized America*. New York, NY: Pearson Longman.

Fortner, R. W., Lee, J. Y., Corney, J. R., Romanello, S., Bonnell, J., Luthy, B., Figuerido, C., & Ntsiko, N. (2000). Public understanding of climate change: Certainty and willingness to act. *Environmental Education Research*, *6*(2), 127-141.

Ghanem, S. (1997). Filling in the tapestry: The second level of agenda setting. In M. McCombs, D. Shaw, & D. H. Weaver (Eds.), *Communication and democracy: Exploring the intellectual frontiers in agenda-setting theory* (pp. 3-14). Hillsdale, NJ: Lawrence Erlbaum Associates.

Groeling, T. (2008). Who's the Fairest of them All? An Empirical Test for Partisan Bias on ABC, CBS, NBC, and Fox News. *Presidential Studies Quarterly*, *38*(4), 631–657. doi:10.1111/j.1741-5705.2008.02668.

Hamilton, L. C., & Stampone, M. D. (2013). Blowin'in the wind: Short-term weather and belief in anthropogenic climate change. *Weather, Climate, and Society, 5*(2), 112-119.

Hart, P. S. (2008). *Market influences on climate change frames in CNN and Fox News climate change broadcasts.* Paper presented at the International Communication Association Annual Meeting. Montreal, Quebec, Canada.

Hart, P. S. (2011). One or many? The influence of episodic and thematic climate change frames on policy preferences and individual behavior change. *Science Communication, 33*(1), 28-51.

Hart, P. S., & Feldman, L. (2014). Threat Without Efficacy? Climate Change on US Network News. *Science Communication, 36*(3), 325-351.

Heath, Y., & Gifford, R. (2006). Free-market ideology and environmental degradation the case of belief in global climate change. *Environment and Behavior, 38*(1), 48-71.

Henderson, M., & Hillygus, D. S. (2011). The dynamics of health care opinion, 2008–2010: Partisanship, self-interest, and racial resentment. *Journal of Health Politics, Policy and Law, 36*(6), 945-960.

Hmielowski, J. D., Feldman, L., Myers, T. A., Leiserowitz, A., & Maibach, E. (2013). An attack on science? Media use, trust in scientists, and perceptions of global warming. *Public Understanding of Science*, *23*(7), 866-883.

Holbert, R. L., Garrett, R. K., & Gleason, L. S. (2010). A new era of minimal effects? A response to Bennett and Iyengar. *Journal of Communication*, *60*(1), 15-34.

Hopkins, K. D., & Weeks, D. L. (1990). Tests for normality and measures of skewness and kurtosis: Their place in research reporting. *Educational and Psychological Measurement*, *50*(4), 717-729.

Iyengar, S., & Hahn, K. S. (2009). Red media, blue media: Evidence of ideological selectivity in media use. *Journal of Communication, 59*(1), 19-39.

Iyengar, S., & Kinder, D. R. (1987). *News that matters: agenda setting and priming in a television age*. Chicago, IL: The University of Chicago Press.

Jacobson, G. C. (2010). Perception, memory, and partisan polarization on the Iraq War. *Political Science Quarterly, 125*(1), 31-56.

Jang, S. M. (2013). Seeking congruency or incongruency online? Examining selective exposure to four controversial science issues. *Science Communication*, *36*(2), 143-167.

Kang, N., & Kwak, N. (2003). A Multilevel Approach to Civic Participation Individual Length of Residence, Neighborhood Residential Stability, and Their Interactive Effects With Media Use. *Communication Research, 30*(1), 80-106.

Kellstedt, P. M., Zahran, S., & Vedlitz, A. (2008). Personal efficacy, the information environment, and attitudes toward global warming and climate change in the United States. *Risk Analysis, 28*(1), 113-126.

Kim, S. H., Han, M., Choi, D. H., & Kim, J. N. (2012). Attribute agenda setting, priming and the media's influence on how to think about a controversial issue. *International Communication Gazette, 74*(1), 43-59.

Kiousis, S. (2005). Compelling arguments and attitude strength exploring the impact of second-level agenda setting on public opinion of presidential candidate images. *The Harvard International Journal of Press/Politics, 10*(2), 3-27.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research, 8*(3), 239-260.

Krosnick, J. A., Holbrook, A. L., Lowe, L., & Visser, P. S. (2006). The origins and consequences of democratic citizens' policy agendas: A study of popular concern about global warming. *Climatic Change, 77*(1-2), 7-43.

Lasorsa, D. L., & Reese, S. D. (1990). News source use in the crash of 1987: A study of four national media. *Journalism & Mass Communication Quarterly, 67*(1), 60-71.

Lee, J. K. (2009). Incidental exposure to news: Limiting fragmentation in the new media environment. Unpublished doctoral dissertation, University of Texas at Austin**.**

Lee, J. K., & Coleman, R. (2014). Testing generational, life cycle, and period effects of age on agenda setting. *Mass Communication and Society*, *17*(1), 3-25.

Lee, G. (2010). Who let priming out? Analysis of first-and second-level agenda setting effects on priming. *International Communication Gazette, 72*(8), 759-776.

Lee, T. T. (2005). The liberal media myth revisited: An examination of factors influencing perceptions of media bias. *Journal of Broadcasting & Electronic Media, 49*(1), 43-64.

Leggett, J. (2001). *Carbon War: Global Warming and the End of the Oil Era*. New York, NY: Routledge.

Leiserowitz, A. A. (2005). American risk perceptions: Is climate change dangerous? *Risk Analysis, 25*(6), 1433-1442.

Leiserowitz, A. A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change*, *77*(1-2), 45-72.

Leiserowitz, A. A., Maibach, E. W., Roser-Renouf, C., Smith, N., & Dawson, E. (2013). Climategate, public opinion, and the loss of trust. *American Behavioral Scientist, 57*(6), 818-837.

Lewandowsky, S., Gignac, G. E., & Vaughan, S. (2013). The pivotal role of perceived scientific consensus in acceptance of science. *Nature Climate Change, 3*(4), 399-404.

Levendusky, M. S. (2013). Why do partisan media polarize viewers?. *American Journal of Political Science*, *57*(3), 611-623.

Lippmann, W. (1922). *Public opinion*. New York, NY: Macmillan.

Liu, X., Lindquist, E., & Vedlitz, A. (2011). Explaining media and congressional attention to global climate change, 1969-2005: an empirical test of agenda-setting theory. *Political Research Quarterly, 64*(2), 405-419.

Lorenzoni, I., & Pidgeon, N. F. (2006). Public views on climate change: European and USA perspectives. *Climatic Change, 77*(1-2), 73-95.

Lorenzoni, I., Nicholson-Cole, S., & Whitmarsh, L. (2007). Barriers perceived to engaging with climate change among the UK public and their policy implications. *Global Environmental Change*, *17*(3), 445-459.

Marquart-Pyatt, S. T., Shwom, R. L., Dietz, T., Dunlap, R. E., Kaplowitz, S. A., McCright, A. M., & Zahran, S. (2011). Understanding public opinion on climate change: a call for research. *Environment: Science and Policy for Sustainable Development, 53*(4), 38-42.

McCombs, M. (1999). Personal involvement with issues on the public agenda. *International Journal of Public Opinion Research*, *11*(2), 152–168.

McCombs, M. (2005). A look at agenda-setting: Past, present and future. *Journalism Studies, 6*(4), 543-557.

McCombs, M. (2004). *Setting the agenda: The mass media and public opinion*. Malden, MA: Blackwell Publishing Inc.,.

McCombs, M. (2014). *Setting the agenda: The mass media and public opinion*: Malden, MA: Polity.

McCombs, M., Lopez‐Escobar, E., & Llamas, J. P. (2000). Setting the agenda of attributes in the 1996 Spanish general election. *Journal of Communication, 50*(2), 77-92.

McCombs, M., & Shaw, D. (1993). The evolution of agenda‐setting research: twenty‐five years in the marketplace of ideas. *Journal of Communication, 43*(2), 58-67.

McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *Public Opinion Quarterly*, 176-187.

McCright, A. M., & Dunlap, R. E. (2011). Cool dudes: The denial of climate change among conservative white males in the United States. *Global Environmental Change, 21*(4), 1163-1172.

McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly, 52*(2), 155-194.

Mendelsohn, R., & Neumann, J. E. (2004). *The impact of climate change on the United States economy*. New York, NY: Cambridge University Press.

Mooney, C. (2015). Troubling new research says global warming will cut wheat yields. Retrieved July 24, 2015 from http://www.washingtonpost.com/news/energy-environment/wp/2015/05/11/troubling-new-study-suggests-global-warming-will-reduce-wheat-yields/

Morris, J. S. (2007). Slanted objectivity? Perceived media bias, cable news exposure, and political attitudes. *Social Science Quarterly*, *88*(3), 707–728. doi:10.1111/j.1540-6237.2007.00479.

Muddiman, A., Stroud, N. J., & McCombs, M. (2014). Media fragmentation, attribute agenda aetting, and political opinions about Iraq. *Journal of Broadcasting & Electronic Media, 58*(2), 215-233.

Napoli, P. M. (2011). *Audience evolution: New technologies and the transformation of media audiences*: New York, NY: Columbia University Press.

Nelkin, D. (1995). *Selling science. How the press covers science and technology*. New York, NY: Freeman.

Newport, F. (2014). Americans show low levels of concern on global warming. Retrieved Augusr 5, 2015 from http://www.gallup.com/poll/168236/americans-show-low-levels-concern-global-warming.aspx

Nie, N. H., Miller III, D. W., Golde, S., Butler, D. M., & Winneg, K. (2010). The world wide web and the US political news market. *American Journal of Political Science, 54*(2), 428-439.

Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment: Science and Policy for Sustainable Development, 51*(2), 12-23.

Nisbet, M. C., & Myers, T. (2007). The polls—trends twenty years of public opinion about global warming. *Public Opinion Quarterly*, *71*(3), 444-470.

Nisbet, M. C., & Scheufele, D. A. (2009). What's next for science communication? Promising directions and lingering distractions. *American Journal of Botany, 96*(10), 1767-1778.

O'Connor, R. E., Bord, R. J., & Fisher, A. (1999). Risk perceptions, general environmental beliefs, and willingness to address climate change. *Risk Analysis, 19*(3), 461-471.

Ogawa, T. (2001). Framing and agenda setting function. *Keio Communication Review, 23*, 71-80.

O'Neill, S., & Nicholson-Cole, S. (2009). "Fear won't do it": Promoting positive engagement with climate change through visual and iconic representations. *Science Communication*, *30*(3), 355-379.

Osborne, J. W. (2010). Improving your data transformations: Applying the Box-Cox transformation. *Practical Assessment, Research & Evaluation*, *15*(12), 1-9.

Patt, A. G., & Schrag, D. P. (2003). Using specific language to describe risk and probability. *Climatic Change, 61*(1-2), 17-30.

Pew Research Center. (2015). Chapter 2: Climate change and energy issues. Retrieved September 5, 2015 from http://www.pewinternet.org/2015/07/01/chapter-2-climate-change-and-energy-issues/

Powlick, P. J., & Katz, A. Z. (1998). Defining the American public opinion/foreign policy nexus. *Mershon International Studies Review, 42*(1), 29-61.

Price, V., & Tewksbury, D. (1997). News values and public opinion: A theoretical account of media priming and framing. In G. A. Barett & F. J. Boster (Eds.), *Progress in communication sciences: Advances in persuasion* (Vol. 13, pp. 173–212). Greenwich, CT: Ablex.

Prior, M. (2013). Media and political polarization. *Annual Review of Political Science, 16*, 101-127.

Project for Excellence in Journalism. (2006). The state of the news media 2006. Retrieved September 15, 2015, from http://www.stateofthemedia.org/2006/cable-tv-intro/

Reser, J. P., Bradley, G. L., Glendon, A., Ellul, M. C., & Callaghan, R. (2012). *Public risk perceptions, understandings, and responses to climate change and natural disasters in Australia, 2010 and 2011*. Meadowbrook: Griffith University.

Ryan, M. (2001). Journalistic ethics, objectivity, existential journalism, standpoint epistemology, and public journalism. *Journal of Mass Media Ethics*, *16*(1), 3–22.

Saad, L. (2015). *U.S. views on climate change stable after extreme winter*. Retrieved July 25, 2015 from: http://www.gallup.com/poll/182150/views-climate-change-stable-extreme-winter.aspx

Saldaña, M., Ardèvol-Abreu, A., Guo, L. & McCombs, M. (2013). *Compelling associations for addressing drug abuse and 'war on drugs' in the U.S.: public opinion and agenda-setting effects*. Paper presented to the World Association for Public Opinion Research (WAPOR) Annual Conference, Nice, France.

Sampei, Y., & Aoyagi-Usui, M. (2009). Mass-media coverage, its influence on public awareness of climate-change issues, and implications for Japan's national campaign to reduce greenhouse gas emissions. *Global Environmental Change, 19*(2), 203-212.

Scheufele, D. A. (2000). Agenda-setting, priming, and framing revisited: Another look at cognitive effects of political communication. *Mass Communication & Society, 3*(2-3), 297-316.

Scruggs, L., & Benegal, S. (2012). Declining public concern about climate change: Can we blame the great recession? *Global Environmental Change, 22*(2), 505-515.

Severin, W. J., & Tankard, J. W. (2001). Communication theories: Origins, methods and uses in mass communication: New York: Addison-Wesley Publishing.

Shabecoff, P. (1988). Global warming has begun, expert tells senate. *The New York Times*. Retrieved May 15, 2015 from http://www.nytimes.com/1988/06/24/us/global-warming-has-begun-expert-tells-senate.html

Shah, D. V. (1998). Civic engagement, interpersonal trust, and television use: An individual-level assessment of social capital. *Political Psychology*, *19*(3), 469-496.

Shapiro, R. Y., & Bloch-Elkon, Y. (2006). *Political polarization and the rational public.* Paper presented at the annual conference of the American Association for Public Opinion Research, Montreal, Canada.

Shehata, A., & Strömbäck, J. (2013). Not (yet) a new era of minimal effects: A study of agenda setting at the aggregate and individual levels. *The International Journal of Press/Politics, 18*(2), 234-255.

Smith, J. (2005). Dangerous news: Media decision making about climate change risk. *Risk Analysis, 25*(6), 1471-1482.

Son, Y. J., & Weaver, D. H. (2006). Another look at what moves public opinion: Media agenda setting and polls in the 2000 US election. *International Journal of Public Opinion Research, 18*(2), 174-197.

Spence, A., & Pidgeon, N. (2010). Framing and communicating climate change: The effects of distance and outcome frame manipulations. *Global Environmental Change, 20*(4), 656-667.

Stevenson, R. L., Böhme, R., & Nickel, N. (2001). The TV agenda-setting influence on campaign 2000. *Egyptian Journal of Public Opinion Research, 2*(1), 29-50.

Stroud, N. J. (2007). Media effects, selective exposure, and Fahrenheit 9/11. *Political Communication, 24*(4), 415-432.

Stroud, N. J. (2010). Polarization and partisan selective exposure. *Journal of Communication, 60*(3), 556-576.

Stroud, N. J. (2011). *Niche news: The politics of news choice*. New York, NY: Oxford University Press.

Sunstein, C. R. (2008). Neither Hayek nor Habermas. *Public Choice, 134*(1), 87-95.

Takeshita, T., & Mikami, S. (1995). How did mass media influence the voters' choice in the 1993 general election in Japan?: A study of agenda-setting. *Keio Communication Review, 17*, 27-41.

Tan, Y., & Weaver, D. H. (2013). Agenda diversity and agenda setting from 1956 to 2004: What are the trends over time?. *Journalism Studies*, *14*(6), 773-789.

The American Presidency Project. (2012). 2012 general election editorial endorsements by major newspapers. Retrieved July 23, 2015, from http://www.presidency.ucsb.edu/data/2012_newspaper_endorsements.php

The Washington Times. (2015). Platitudes, bromides and 'tipping points.' Retrieved August 5, 2015 from http://www.washingtontimes.com/news/2015/may/5/editorial-global-warming-tipping-point-cliche/

Tomarken, A. J., & Serlin, R. C. (1986). Comparison of ANOVA alternatives under variance heterogeneity and specific noncentrality structures. *Psychological Bulletin*, *99*(1), 90-99.

Trumbo, C. (1996). Constructing climate change: claims and frames in US news coverage of an environmental issue. *Public understanding of science, 5*(3), 269-283.

Wanta, W., Golan, G., & Lee, C. (2004). Agenda setting and international news: Media influence on public perceptions of foreign nations. *Journalism & Mass Communication Quarterly, 81*(2), 364-377.

Watt, J. H., Mazza, M., & Snyder, L. (1993). Agenda-setting effects of television news coverage and the effects decay curve. *Communication research*, *20*(3), 408-435.

Weber, E. U. (2006). Experience-based and description-based perceptions of long-term risk: Why global warming does not scare us (yet). *Climatic change, 77*(1-2), 103-120.

Weber, E. U., & Stern, P. C. (2011). Public understanding of climate change in the United States. *American Psychologist, 66*(4), 315.

Wilkins, L., & Patterson, P. (1987). Risk analysis and the construction of news. *Journal of Communication, 37*(3), 80-92.

Willnat, L. (1997). Agenda setting and priming: Conceptual links and differences. In M. E. McCombs, D. L. Shaw, & D. I. Weaver (Eds.), *Communication and democracy: Exploring the intellectual frontiers in agenda-setting theory* (pp. 51-66). Mahwah, New Jersey: Lawrence Erlbaum.

Wolf, J., & Moser, S. C. (2011). Individual understandings, perceptions, and engagement with climate change: insights from in‐depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change, 2*(4), 547-569.

WorldWatch Institute. (2008). A climate hero: The testimony. Retrieved August 5, 2015 from http://www.worldwatch.org/node/5790

Yu, J. (2005) *''News on the Web: agenda setting of online news in web sites of major newspaper, television and online news services.''* Paper presented to the International Communication Association, New York.

Zehr, S. C. (2000). Public representations of scientific uncertainty about global climate change. *Public Understanding of Science, 9*(2), 85-103.

Zhao, X., Rolfe-Redding, J., & Kotcher, J. E. (2014). Partisan differences in the relationship between newspaper coverage and concern over global warming. *Public Understanding of Science*, Online first. DOI: 0963662514558992.